



BÖHNKE + PARTNER®
GMBH STEUERUNGSSYSTEME



Installation Manual

System »bp306«

- General Tips
- Security Information
- Commissioning
- EC-Type Examination



BÖHNKE + PARTNER®
GMBH STEUERUNGSSYSTEME



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1 General

1.1 Many Thanks

Dear Customer!

Many thanks for the confidence you placed in BÖHNKE + PARTNER GmbH by buying the control system »bp306«.

Please carefully read through the installation manual and the documentation of the components as improper handling might bring along a high danger of injury.

Adhere to every hint in order to save much time and many consultations while installing the system.

„Installation Manual“ stands for the whole documentation that shall serve you with comprehensive information about our company and our product range. For quick reference and overview the installation manual is clearly outlined in different chapters. It deals with the dangers and risks that may result in serious injuries and costly damages. Last but not least it provides the information required for installing and commissioning the control system.

The installation manual is supplied together with every control unit thus forming part of the entire documentation of your control system.

Anyhow, should you have any question, please do not hesitate to contact us:

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▲ **Picture 1**

The control system bp306 is equipped with all up-to-date interfaces of the elevator technology.

1.2 Application

The control system »bp306« is an equipment applied for elevators.

1.3 Documentation



This installation manual does not inform you of our complete range of supply. Every detail mentioned therein shall merely describe the product but not be understood as a promised feature in legal terms. Possible claims for compensation – for any legal reason whatsoever – are barred subject to willful act and culpable negligence. We do not warrant the circuits resp. processes mentioned to be clear from third-party industrial property rights. Reprints – in a whole or in excerpts - are admitted only with the prior consent of BÖHNKE + PARTNER GmbH and subject to proper acknowledgements.

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Contents of this installation manual is checked in regular intervals. Necessary corrections are contained in the subsequent issues.

Warnings as well as special information in this technical manual are marked as follows and highlighted by the corresponding symbols.



ATTENTION!

This mark is used to point out that inaccurate observance or non-observance of the instructions or procedures may result in damages to the equipment, in injuries or fatal accidents.



CAUTION!

This warning is set, if inaccurate observance or non-observance of the instructions or procedures may lead to injuries or fatal accidents by electric current.



INFO!

This highlight is used to point to special information.

2 Security Information

Prior to installing and commissioning this unit carefully read the security instructions and warnings and pay attention to every warning label attached to the unit. Make sure that the warning labels are readable all time and replace missing or damaged labels.



2.1 Qualified Personnel

Qualified personnel in the sense of the documentation resp. of the warnings on the appliances themselves are persons, who are familiar with the erection, installation, commissioning, operation and maintenance of the appliances and dispose of qualifications that are appropriate with the work, such as for example:

- ▶ apprenticeship and skill resp. authorisation to switch, earth and label power circuits and appliances in accordance with the standards and security technique.
- ▶ apprenticeship and skill in the maintenance and operation of the appropriate safety devices according to the standards.
- ▶ first-aid training.

2.2 Security instructions Concerning Control

Units

CAUTION!

Excerpt from the »Merkblatt über Sicherheitsmaßnahmen bei der Montage und Instandsetzung von Aufzugsanlagen« (ZH 1/312; Ausgabe: 10/1983) (memorandum on safety measures to be taken while erecting and maintaining elevators) issued by "Hauptverband der gewerblichen Berufsgenossenschaften" (association of industrial trade cooperatives):

3.1) Notification

If a field engineer has to work alone on an elevator plant, he has to notify the elevator attendant or any other person in the building (e.g. janitor, inhabitant) of his presence.

3.2) Blocking The Elevator Plant

Prior to starting work on the elevator plant block it for normal operation. At every landing door apply a label saying: »Elevator out of operation«. Open shaft accesses are to be blocked in a way that unauthorized persons cannot gain access to them.

3.3) Landing controls

Prior to starting work switch the landing controls off.



3.4) Assistant workers

If the field engineer has to execute work that requires the presence of a second person, this can be the elevator attendant or any other instructed person.

3.5) Short-circuiting of control lines and switches

It is forbidden to short-circuit control lines and switches during the course of maintenance and inspection work. If repair work cannot be done without short-circuiting control lines and switches, the bridge has to be laid with utmost care. Immediately after having completed the repair work, the bridge has to be removed again.

3.6) Switch declaration

Temporary switch declarations or switch declarations upon heckling are forbidden.

3.7) Work with live electric components, if necessary at all, is to be executed by using isolated tools only and a substratum and appropriate personal security equipment. The pertinent instructions of the safety regulations DIN EN 50110 part 1 and part 2 / DIN VDE 0105 part 100 »Betrieb von elektrischen Anlagen« (how to operate electric appliances) are to be adhered to.

3.8) Elevator Operation

Up to completion of the installation work, the field engineer must not operate the elevator unless it is necessary.

3.9) Staying on top of the car

While travelling on the car-roof switch the inspection switch on, if available. It is after that only that the landing door may be closed. If there is no inspection switch, an instructed assistant worker has to do the car travelling.

Persons staying on the car roof are allowed to enter a command resp. switch pulse making the car travel only, if all persons present there have receded behind the outlines of the car. It is forbidden to continue working during travelling.

There must not stay more persons on the car roof than required for executing the work.

2.3 Demands On Erector And User Of The Elevator Plant

ATTENTION!

- The control system »bp306« has been manufactured according to the state of the art and is safe to operate. Risks will be provoked only, if unauthorized persons use the equipment inappropriately and unduly.
- Perfect and safe operation of the devices is subject to appropriate transport, storage, erection and installation as well as to careful operation and maintenance.
- Refrain from any action that might infringe the safe functioning of the equipment.
- Arbitrary reconstruction and changes might infringe the safe functioning of the equipment and are forbidden.
- During operation the driving components are partly live with high voltages, moving or rotating. It might therefore occur that these parts cause severe injuries to persons or material damages in cases of unauthorized removal of necessary covers or insufficient maintenance.
- Only qualified personnel may be ordered to work on the equipment. The personnel must have the complete documentation (operating manual and all other documents and documentations) at their disposal all the time they work on the equipment and must consistently adhere to it.
- It is forbidden to unskilled personnel to work on the equipment or near by it.
- The owner is liable that the drive unit of the equipment is set to a secure condition in case of its failure, as otherwise persons can be injured or material damaged.



CAUTION!

Prior to every action on the equipment switch it off the mains supply.



3 Type Test Certificates

3.1 EC-Type Test Certificate

Picture 2

EC-type test certificate for printed-circuit board BPL-02 of control system bp306

Zertifikat	
über eine EG- Baumusterprüfung	
Registrier-Nr.	01/208/5A/1103/1644Ae2
Firma	Die TÜV CERT-Zertifizierungsstelle für Aufzüge und deren Sicherheitsbauteile der TÜV Rheinland Industrie Service GmbH bescheinigt hiermit dem Unternehmen Böhnke + Partner[®] GmbH STEUERUNGSSYSTEME Industrieweg 13 D- 51429 Bergisch Gladbach
Produkt	die Übereinstimmung des Produktes
Typ	elektrisches Sicherheitsbauteil Systemmodul bp117, bp304 und bp306 als Teilbereich der Leiterplatte BPL-02 mit den Anforderungen der Richtlinie 95/16/EG des Rates vom 29.06.1995 zur Angleichung der Rechtsvorschriften über Aufzüge. Der Nachweis wurde am 14.01.2009 erbracht durch eine Konformitätsprüfung.
Prüfgrundlagen	Prüfbericht Nr. 01/208/5A/1103/1644Ae2 vom 2009-01-13. Aufzugsrichtlinie 95/16/ EG
Verwendung	Sicherheits- und Abfrageschaltung Dieses Zertifikat gilt für das Inverkehrbringen bei Übereinstimmung der Bauausführung mit den geprüften Unterlagen bis 14.01.2014. Technische Einzelheiten siehe Anlage.
Köln, 2009-01-14	<i>Volker Sopanski</i> Dipl.-Ing. Volker Sopanski Tel. +49 221 908 - 2624
TÜV CERT-Zertifizierungsstelle für Aufzüge und deren Sicherheitsbauteile der TÜV Rheinland Industrie Service GmbH Notifiziert unter Nr. 0035 TÜV Rheinland Industrie Service GmbH, Am Grauen Stein, D-51105 Köln	
www.tuv.com  TÜVRheinland[®] Genau. Richtig.	

3.2 EC-Approval bp306

Certificate Nr. (95/16EG): 01/208/5A/1103/1644

Approving Authority, Id.-No. 0671

3.3 Certificate of Conformity



EG - Konformitätserklärung im Sinne der EG-Richtlinie (95/16/EG)

Hiermit erklären wir, dass die folgend bezeichneten Sicherheitsbauteile:
(Erläuterung der Spalte „Art“: A = Abfrageschaltung ; S = Sicherheitsschaltung)

Baugruppe	Art	Teilbereich der Leiterplatte(n)	Zertifikatsnummer gemäß Aufzugsrichtlinie (95/16/EG)
SMZ-03	S		09 208 92602 / 5
Systemmodul bp115	S+A	BCL-01	09 208 92603 / 5
Systemmodul bp302	A	CLP-03	09 208 92604 / 5
Systemmodul bp300	A	CCP-01	09 208 92605 / 5
FDG-02	A	FDG2-B, FDG2-E	09 208 92606 / 5
Systemmodul bp117/bp304	S+A	BPL-01	09 208 92612 / 5
Systemmodule bp117/bp304/bp306	S+A	BPL-01 o. BPL-02	01/208/5A/1103/1644Ae1
SMZ-04	S		01/208/5A/0408/1770
FDG-03	A	FDL-01	01/208/FWB/B/0106/1311Ae1

ab Baujahr 1999 den Beschaffenheitsanforderungen entsprechen, die in der Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Aufzüge (95/16/EG) festgelegt sind. Die Sicherheitsbauteile entsprechen den gültigen Vorschriften und Normen: 12. GSGV ; DIN EN 81-1/2, Ausgabe 2000-05

Diese Erklärung gilt nur, wenn oben bezeichnete Sicherheitsbauteile in Aufzugsanlagen eingebaut werden. Bei einer unbefugten Änderung unserer Sicherheitsbauteile verliert diese Erklärung ihre Gültigkeit. Die mitgelieferten Betriebsanleitungen müssen beachtet werden! Die entsprechenden Bauteil- oder Bauartprüfungen wurden durch das Prüflabor des TÜV Rheinland, Sicherheit und Umweltschutz GmbH vorgenommen. Die EG - Baumusterprüfbescheinigungen mit den EG - Zertifikatsnummern wurden von der TÜV CERT - Zertifizierungstelle für Aufzüge und Sicherheitsbauteile der TÜV Anlagentechnik GmbH (benannte Stelle, Kennnummer 0671, seit 2005 Kennnummer 0035) ausgestellt.

Diese Erklärung wird verantwortlich für

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51429 Bergisch Gladbach 1

im Namen der Geschäftsleitung abgegeben durch Joachim Ramrath.

Bergisch Gladbach, den 20. Juni 2006

(Joachim Ramrath, Mitglied der Geschäftsleitung, Leiter Qualitätsmanagement)

Formular-Nr.: 0003VK08 DOC ; Stand: 20. Juni 2006



BÖHNKE + PARTNER®
GMBH STEUERUNGSSYSTEME

EG - Konformitätserklärung

im Sinne der EG-Richtlinie (89/336/EWG, geändert durch 92/31/EWG)
und den Normen EN 12015 und EN 12016

Hiermit erklären wir, dass das folgend bezeichnete Produkt

Steuereinheit

Identifikation:

Aufzug-Steuerungssystem (Schaltschrank), bp115, bp117, bp300, bp302, bp304, bp306

den Schutzanforderungen entspricht, die in der Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit (89/336/EWG, geändert durch 92/31/EWG) festgelegt sind sowie seit der Harmonisierung die Normen EN12015 und EN12016.

Diese Erklärung gilt für alle Erzeugnisse, die gemäß den anhängenden Unterlagen - die Bestandteil dieser Erklärung sind - hergestellt werden.

Bei einer unbefugten Änderung unseres Erzeugnisses verliert diese Erklärung ihre Gültigkeit.

Die mitgelieferten Betriebsanleitungen müssen beachtet werden!

Die entsprechenden Testmessungen wurden von den Prüflaboren des TÜV Berlin - Brandenburg, BZT Kolberg und TÜV Rheinland durchgeführt.

Die Konformitätsbewertungen erfolgten durch die zuständige Stelle:

TÜV Rheinland Product Safety GmbH

Die Bescheinigung für bp115 trägt die Zertifikat-Registrier-Nr.: AV 9711203_01

Die Bescheinigung für bp117 trägt die Zertifikat-Registrier-Nr.: AV 2110188_01

Die Bescheinigung für bp300, bp302 trägt die Zertifikat-Registrier-Nr.: AV 9611109_01

Die Bescheinigung für bp304 trägt die Zertifikat-Registrier-Nr.: AV 2010741_01

Die Bescheinigung für bp306 mit 71W-Netzteil trägt die Prüfberichts-Nr.: 21121247_001

Die Bescheinigung für bp306 mit 130W-Netzteil trägt die Prüfberichts-Nr.: 21122666_001

Diese Erklärung wird verantwortlich für

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im Namen der Geschäftsleitung abgegeben durch Joachim Ramrath.

Bergisch Gladbach, den 20. Juni 2006

(Joachim Ramrath, Mitglied der Geschäftsleitung, Leiter Qualitätsmanagement)
Formular-Nr.: 0006VK06 DOC ; Stand: 20. Juni 2006

4 Standards

TIPS REGARDING OTHER REGULATIONS AND NOTES CONCERNING RISKS

- The procedural tips and excerpts from circuit diagrams given everywhere in the technical documentation are to be applied *mutatis mutandi*, i.e. to be checked for every application. BÖHNKE + PARTNER will not accept any liability for their individual suitability.
- To ascertain proper functions of the complete control system, you will at any rate have to comply with the documentations of the manufacturers of other components, which are supplied to you as well (e. g. operation instructions for the frequency inverter).
- The control system bp306 must exclusively be used for the information processing in elevator control systems.
- Control units, printed-circuit boards, modules or other devices that have been damaged on their transport to you must not be used or commissioned.
- Printed-circuit boards comprise electrostatically damageable elements. Therefore, before touching any electronic component make sure that your own body has been discharged. You can do this by touching a conductible earthed object (e. g. bare-metal parts of the control cabinet).



4.1 EMC-Directives

Every industrial, electronically controlled device, such as for example PC, micro-processor, computer, SPS, can be influenced by interference pulses, provided that it has not been protected accordingly. These interference pulses can be caused by external appliances, such as e. g. voltage fluctuations in the feed-line or control pulses of the power parts in the frequency inverter as well. BÖHNKE + PARTNER have taken all common measures while manufacturing the control unit and used components that are only slightly sensible to interferences from their environment.

ATTENTION!

- In any case follow the EMC-instructions given by the manufacturer of the frequency inverter!
- Should you have any question concerning EMC-directives please ask our service-team. They will be pleased to be of service to you.
- Pay attention to the tips concerning interference-suppressing measures given in this manual as well.



4.2 EN 81

Regulations by EN 81-2:

We providently point to the fact that BÖHNKE + PARTNER do not accept any liability for damages that might be traced back to the adherence to EN 81-2 regulations!

Example: Relevelling of a hydraulically operated elevator even in case that the runtime monitoring has responded due to a phase failure.

5 Control System»bp306«

5.1 Description of the Product and its Functions

The control system bp306 is an electronic component for the control of elevators. There are different executions available, with safety circuit interrogators for different voltages and different power units with or without integrated safety circuit. Basic functions of an elevator control unit, such as stabilized power unit, safety circuit interrogator and safety circuit have consistently been integrated in the control system bp306.

The control system bp306 is a decentralized multi-microprocessor-system with distributed »intelligence«. According to the standard, the decentralized components are linked to it via its two CANopen interfaces. There are further interfaces for older protocols common with the elevator industry.

The control system bp306 is composed as follows:

- ▶ stabilized, primarily clocked power unit with 2 voltages
 - 5 V DC 2 A (internal only),
 - 24 V DC 2,5 A resp. 5 A (at the terminals),
- ▶ pre-control,
- ▶ safety circuit interrogator,
- ▶ safety circuit (optional),
- ▶ freely programmable inputs, outputs and relays,
- ▶ electronically monitored standard inputs and outputs as well as interfaces for:
 - ▶ the selection of the frequency inverter with DCP01/04-interface,
 - ▶ absolute encoders of different makes and technics,
 - ▶ data remote diagnosis with WinMOS®300 by analogue modem, ISDN, GSM or Ethernet,
 - ▶ building automation by EIS-protocol or LONworks-standard,
 - ▶ CANopen CiA-417 components.

Basing on these concentrated functions and the conception of decentralized control small control cabinets can be used. The standard control cabinet for the control system bp306 is 600 x 600 x 250 mm and thus predestined for elevators with constricted space only. In combination with the data remote monitoring system WinMOS®300 it can significantly increase the availability of the elevator. Moreover, this system allows you to completely relate the servicing intervals to the requirements.



▲ **Picture 3**

The elevator control system bp306, equipped with all interfaces required for up-to-date elevator technics.

5.2 Summary of the Functions of bp306

- ▶ Controls of a single elevator
- ▶ Controls of a bank of 8 elevators without group computer
- ▶ 64 landings predeterminable (can be extended up to 128)
- ▶ SFS – automatic push-button control
- ▶ SFR – automatic push-button control with landing call memory (»Taxi control«)
- ▶ 1KS – 1-button collective control
- ▶ 1KSab – 1-button down-collective control
- ▶ 1KSauf – 1-button up-collective control
- ▶ 2KS – 2-button up- and down-collective control
- ▶ Operating data logging: starts, operating time, malfunctions, messages
- ▶ Rope-traction elevator: pole-changing, one speed, two speeds, speed- control, variable frequency drive, Ward-Leonard-drive (variable voltage)
- ▶ Hydraulically operated elevator: star-delta and direct start, valve control, soft start, variable frequency
- ▶ Positive-temperatur-control of drive motor, integrated
- ▶ Safety circuit, integrated (230 V AC standard, 48 V DC option)
- ▶ Main contactor selection 230 V AC, integrated
- ▶ Safety circuit type SMZ-04 integrated
- ▶ Internal primarily clocked, stabilized and short-circuit resistant mains power pack with terminal connector to the control unit
- ▶ Inputs and outputs for every standard application, integrated
- ▶ Inputs and outputs for SMD-assembly
- ▶ Inputs and outputs expandable in steps
- ▶ Positive circuitry (24 V DC)
- ▶ Outputs overload-protected
- ▶ Diagnosis of inputs and outputs suitable for diagnosis by LCD or laptop
- ▶ Diagnostics and configuration of the CANopen-components by CANwizard®
- ▶ Microprocessor system as a SMD
- ▶ Co-processor backing (2 units 16 Bit)
- ▶ Operator-guidance by laptop with WinMOS®300
- ▶ Operator-guidance by 4 keys and LC-display
- ▶ Parameter setting on site by LCD or laptop
- ▶ Parameters safely memorized in EEPROM (2 complete data sets)
- ▶ Real-time clock integrated
- ▶ Basic menu separated from service menu
- ▶ Code lock can be set separately
- ▶ Menus provided in German, English, Dutch, Italian and French

- ▶ Interfaces for remote diagnosis, AWG-05, DCP and CANopen, integrated
- ▶ Optional modem, ISDN, GSM or Ethernet integrated
- ▶ Different codes possible for landing signals and direction indicator (Gray, binary etc.)
- ▶ Zero-load, full-load and overload
- ▶ Direction indicator, landing gong, selecting landing door as well as direction of travel
- ▶ Home landing settable
- ▶ Fire emergency landing and emergency power landing settable
- ▶ Monitoring and waiting landing settable
- ▶ Fire brigade landing settable
- ▶ Parking programs settable by LCD
- ▶ Door tables A and B externally switchable
- ▶ Magnet-switch selector with 4 and 6 switches
- ▶ Absolute-encoding selector with AWG-05 executed either in RS485- or CANopen
- ▶ Next landing and short landing distance up to 15 mm (with absolute encoding only)
- ▶ Selective landing calls for door sides A, B and C
- ▶ Priority landing calls with three stages
- ▶ Door-selection for sides A, B and C (every door operator)
- ▶ Doors adjustable to different times and functions
- ▶ Zone module (SMZ04) for doors starting to open during landing approach and for relevelling
- ▶ Door locks on side A, B or C separately selectable by lockage control
- ▶ Service intervals settable in relation to starts, operation time and real time
- ▶ Batch memory of up to 128 messages (type of malfunction, landing and time (date and hour)
- ▶ Malfunction list (type, landing and incidence)
- ▶ Monitoring possible with laptop on site
- ▶ Remote fault diagnostics possible with WinMOS®300 via Modem, ISDN or Ethernet
- ▶ 2 relays, freely programmable with one normally open contact
- ▶ 2 relay, freely programmable with one normally closed contact
- ▶ 4 relays, freely programmable with one double-throw contact for e. g. door A and door B for electronic door control units
- ▶ Company logo (text) settable in LCD
- ▶ RoHS-conforming production (leadless)

5.3 Decentralized Elevator Control

Bp306 is a decentralized control system, i.e. the intelligence is distributed on the linked devices and does no longer exclusively take place in a centre unit. This decentralized elevator control is based on the CANopen application profile CiA-417. It is via this globally standardized application profile that the different components of the elevator bank communicate. The linked components dispose of a complete functional scheme each and are thus in a position to take many decisions themselves. This profile enables open modular systems that can do very consistent control tasks.

5.4 The Group System

The up-to-date group control system is equipped with a powerful 32-bit processor able to evaluate a large variety of information from the single elevators within the shortest time and take the decisions for the group operation.

The group control system warrants a smooth operation of a group of two to eight elevators, basing on the CANopen-based application profile CiA-417. On the bus all the information on commands at hand and operational status of each elevator are available in the nature of the standard. Each group computer is thus enabled to appoint the elevator to execute the commands and that in the most useful sequence. There is no need for a superimposed host computer.

Landing calls are entered via bus-nodes that may be located in the landing call unit or in the control cabinet. The node evaluates the signal received and places it - as a standardized message that states direction, priority, destination etc. - at the disposal of all group members on the CAN-bus at once.

Within the group the algorithms of the call controllers allocate the commands to the single elevators according to the set parameters (e. g. up- and down-collective control, threshold limit after starting, etc.). If an elevator is not participating in the group operation, as it has for example been switched to inspection operation for maintenance purposes, this will be taken into account immediately by the other elevators of the group, as this information is available on the bus as well.

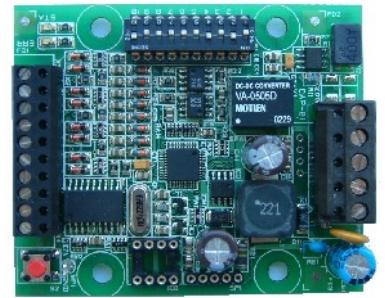
5.5 Components of bp306

BÖHNKE + Partner can supply the following components for the control system bp306:

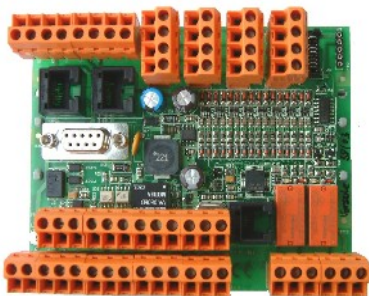
- ▶ Landing call unit CAP-01
- ▶ Car operation unit CLK-01
- ▶ CAN-Data Communication-Gateway CDG-01

Further components from different manufacturers, such as for example absolute encoders or push-button units complying with the standard CiA-417 are available and can be applied.

A list of CANopen-components available and their description can be seen on www.CANopen-Lift.org.



▲ **Picture 4**
printed-circuit board CAP-01
connecting landing calls to the
CANopen-Bus.



▲ **Picture 5**
Printed-circuit board CLK-01
connecting the car electronics
to the CANopen-Bus.



▲ **Picture 6**
Printed-circuit board CDG-01
serving as a gateway between
CANopen-networks or for data
remote diagnosis.

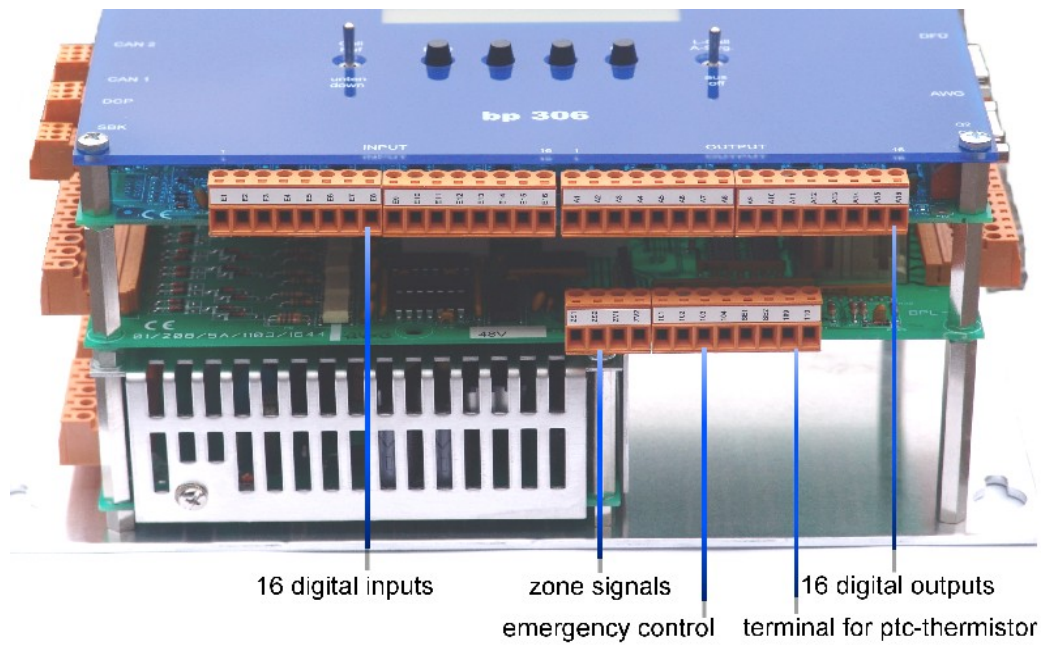
5.6 Variants of bp306

This installation manual refers to all variants of bp306, as mentioned in the following list stating the type designations and their meaning:

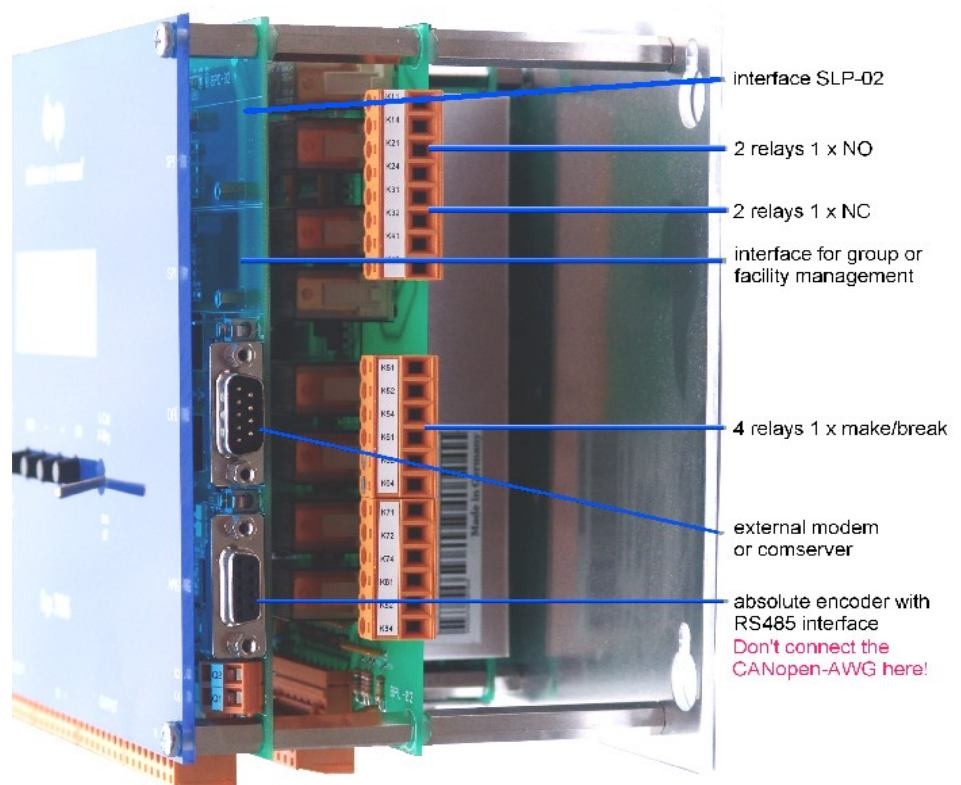
- SMZ = safety circuit (safety module zone)
- 48 V = Option 48 V safety circuit query
- MOD = internal modem
- ISDN = internal ISDN-Interface
- ETH = internal Ethernet-Interface
- 130 W = power unit of 130 VA

Article number	Type
382-306-010-aaa	bp306 Standard
382-306-010-aab	bp306 with 48 V
382-306-010-aac	bp306 with SMZ
382-306-010-aad	bp306 with 48 V/SMZ
382-306-010-aca	bp306 with GRP
382-306-010-acb	bp306 with 48 V/GRP
382-306-010-acc	bp306 with SMZ/GRP
382-306-010-acd	bp306 with 48 V/SMZ/GRP
382-306-010-aea	bp306 with MOD
382-306-010-aeb	bp306 with 48 V/MOD
382-306-010-aec	bp306 with SMZ/MOD
382-306-010-aed	bp306 with 48 V/SMZ/MOD
382-306-010-aia	bp306 with ISDN
382-306-010-aib	bp306 with 48 V/ISDN
382-306-010-aic	bp306 with SMZ/ISDN
382-306-010-aid	bp306 with 48 V/SMZ/ISDN
382-306-010-ana	bp306 with ETH
382-306-010-anb	bp306 with 48 V/ETH
382-306-010-anc	bp306 with SMZ/ETH
382-306-010-and	bp306 with 48 V/SMZ/ETH
382-306-010-baa	bp306 with 130 W
382-306-010-bab	bp306 with 130 W/48 V
382-306-010-bac	bp306 with 130 W/SMZ
382-306-010-bad	bp306 with 130 W/48 V/SMZ
382-306-010-bca	bp306 with 130 W/GRP
382-306-010-bcb	bp306 with 130 W/48 V/GRP
382-306-010-bcc	bp306 with 130 W/SMZ/GRP
382-306-010-bcd	bp306 with 130 W/48V/SMZ/GRP
382-306-010-bea	bp306 with 130 W/MOD
382-306-010-beb	bp306 with 130 W/48 V/MOD
382-306-010-bec	bp306 with 130 W/SMZ/MOD
382-306-010-bed	bp306 with 130 W/48 V/SMZ/MOD
382-306-010-bia	bp306 with 130 W/ISDN
382-306-010-bib	bp306 with 130 W/48 V/ISDN
382-306-010-bic	bp306 with 130 W/SMZ/ISDN
382-306-010-bid	bp306 with 130 W/48 V/SMZ/ISDN
382-306-010-bna	bp306 with 130 W/ETH
382-306-010-bnb	bp306 with 130 W/48 V/ETH
382-306-010-bnc	bp306 with 130 W/SMZ/ETH

5.7.3 Bottom Shot



5.7.4 Right Side-View



5.7.5 Operator Panel and LCD of bp306

By means of the operator panel and the LC-display the operational status of the elevator can be determined and parameters can be set.

As a default the following information is displayed on the LCD:

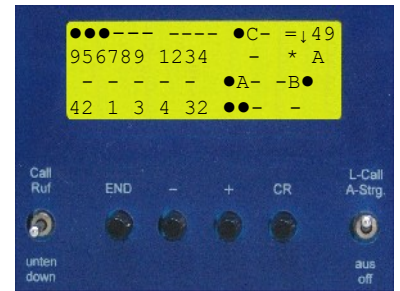
- ▶ Status of the safety circuit (terminals X 5.9/.16/.17/.18/.19)
- ▶ Pre-control (relay K1-K4)
- ▶ Malposition information (flush-level control) +/- -
- ▶ Direction of travel and car position
- ▶ Status of the landing controls (on/off)
- ▶ Doors A/B/C with limit switches and reversal signals (photocell, »door open« push-button)
- ▶ Signalization of travels
- ▶ Status of the earth leakage circuit breaker

By pressing »+« or »-« you can scroll through the classical display of every control unit make BÖHNKE + PARTNER and get the following additional information:

- ▶ logo »B+P« (resp. any sign/logo specified by you) or as an option the temperature in the control cabinet
- ▶ real time with flashing colon,
- ▶ in case of group operation the number of the group elevator G1-G8,
- ▶ in case of group operation the status of the remote data communication link and the current group status,
- ▶ malposition information (flush-level control) +/- -
- ▶ direction of travel and car position,
- ▶ number of landings and direction of travel.

HINT!

Press »CR« to get to the car command menu in order to enter specific commands.



Picture 7

Display of bp306, showing three doors A, B and C.





Picture 8
Service menu of bp306

5.7.6 Start into the Service Menu

Press any button to automatically get to the service menu. If a service code (secret number) has been agreed, you will have to enter the correct 4-digit code. BÖHNKE + PARTNER do not preset any service codes by default. After that you can call in every menu and every parameter of the service menu and change it in the normal operation mode. If the control unit is to be encrypted after having left the service menu, please press the button »END« as often as it requires to read on the LC-display the question:

Code to be activated? OK?

Confirm by pressing »CR« and after the question:

are you sure ?

press »CR« once more.

The service code can be changed or agreed anew in the service menu at any time you want.

5.7.7 Start into the Basic Menu

The basic menu comprises basic parameters that cannot be changed in the normal operation mode. To get into the basic menu, proceed as follows:

- ▶ First switch off the elevator control by switch 6S6.
- ▶ Now put the left switch »Call« down
- ▶ And switch the elevator on again.

You will shortly see the display:

> system-start <

And then you will be in the basic menu and the elevator control functions are completely switched off. If a basic code (secret number) has been agreed, please enter the correct 4-digit number. BÖHNKE + PARTNER has preset it to >5061<.

After that you can call in every menu and parameter and change it. To leave the basic menu put the left switch »call« up again. A reset is executed and the starting display of bp306 can be seen again.



Picture 9
Basic menu of bp306



HINT HOTKEY »END/CALL«

Provided that the elevator is standing still you can get into the basic menu without having to switch off the elevator. First press the END-button and keep it pressed for example by your middle finger in order to simultaneously switch the left CALL-button down by your index finger.

5.7.8 Starting the Monitor

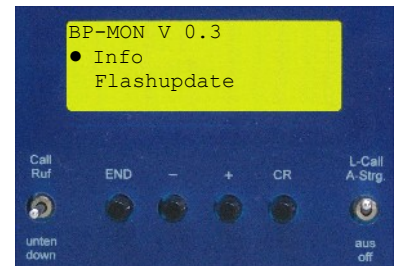
The program variants of the single processors can be queried by the BP-monitor and a software update of the system can be executed by it as well. This should be done by skilled personnel and if ordered by BÖHNKE + PARTNER only. To get to the monitoring program of bp306 the END- and the CR-button are to be pressed simultaneously for about two seconds. This action will start the monitor and cut off all control functions!

5.7.9 Signals, Buttons and Switches

LCD, 4 lines of 20 characters each for text output

Example of an elevator within a group (G3)

Signal „G3“	elevator G3 does not have a connection to the group and is not in the group operation mode (no point),
Signal „G3.“	elevator G3 has got a connection to the group but does not take part in the group operation (one point after G3)
Signal „G1:“	elevator G3 has got a connection to the group and takes part in the group operation (colon after G3)
Signal =	car position is flush with landing level, both flush-level switches are closed
Signal +	car is not quite flush with landing level, it is a little too high
Signal -	car is not quite flush with landing level, it is a little too low
Signal /	car is outside flush level area
Signal 4	landing position: car is at landing 4
Signal ↑	Arrow up/down, no direction of travel
Signal ↑	Arrow up, travelling up
Signal ↓	Arrow down, travelling down
Switch »Call«	switched up – call to the topmost landing, switched down – call to the bottom landing, Activating this switch will cancel all other calls. (e. g. For maintenance purposes or acceptance test)
Button »END«	Each time this button is pressed, the menu or submenu will be branched one step back. Entries not yet confirmed by CR may be reset by that.
Button »-«	Each time this button is pressed the cursor resp. parameter is set back by one step. This refers to menus, submenus and parameter setting (e. g. times or functions).
Button »+«	Each time this button is pressed the cursor resp. parameter is set forth by one step. This refers to menus, submenus and parameter setting (e. g. times or functions).



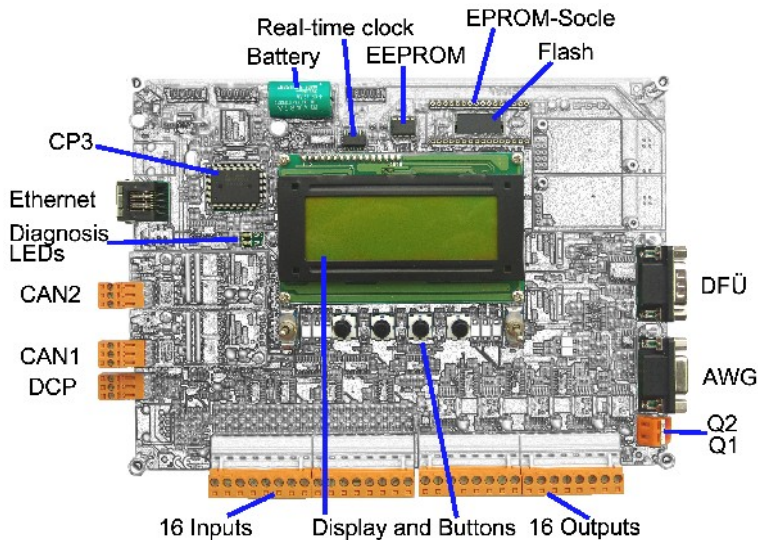
Picture 10

The monitoring program of bp306

Button »CR«	Each time this button is pressed the called-up menu, sub menu or parameter set is confirmed.
Switch »L-Call«	Switched up: landing control is activated Switched down: landing control is deactivated

5.7.10 EPROM, EEPROM and Flash

5.7.10.1 General



Picture 11

Printed-circuit board BPC-02, arrangement of the most important components and interfaces.

Position of EPROM, EEPROM and flash-memory can be seen on the printed-circuit board BPC-02 housing the digital control electronics viz the processors Fujitsu MB90F583, MB90F543 and Motorola 68302, RAM, program memory as flash and EPROM, parameter memory as EEPROM, real time clock, battery, LC-display and buttons. The interfaces for data remote transmission, selection of AWG-05, group operation and die serial selection of the frequency inverter by DCP are mounted to the board as well. In addition, bp306 disposes of two CANopen-interfaces which are controlled by the coprozessor CP3.

The elevator program is normally stored in the flash memory. If there is an EPROM with

an elevator program in the socle, the flash memory will be ignored and the program of the EPROM executed.

The EEPROM memorizes all data related to the elevator such as type of elevator, landings, doors, times, parking landing etc. in fail-proof form.

5.7.10.2 Exchange

To exchange the EPROM use a special snag and draw the EPROM from the socle at right angle. Insert the new EPROM at right angle and press it in the socle with slight pressure.



HINT!

As the pins of EPROMs and EEPROMs are at risk to be bent and broken off, it is strongly recommended to use a snag as an appropriate tool.

ATTENTION!

The guarantee is extinct by program changes and changes of the elevator controls executed without participation of the BÖHNKE + PARTNER services.



5.7.10.3 Software Update

A software update will be necessary, if the elevator plant is to be refurbished with additional functions. Exchanging the EEPROM will be necessary only, if newly programmed functions require a new EEPROM or if the printed-circuit board BPC 02 requires to be exchanged and the data related to the elevator have to be taken over to the new printed-circuit board.

HINT!

Before each software update you should safeguard the actual status of the elevator plant and produce an EEPROM-duplicate. After that the elevator plant equipped with the new software should be checked as from the EPROM without executing a flashupdate. EEPROM-duplicates can be produced by means of the basic menu (diverse). Blank EEPROM-ICs can be provided from our Service Department at any time.



There are two possibilities to do a software update. Either by an EPROM or via a serial interface.

To update the software by an EPROM plug the EPROM containing the new software version into the socket of the printed-circuit board BPC-02. Switch the control unit on and press the buttons »END« and »CR« for about two seconds. This will start the monitoring program. Call up the menu item FLASHUPDATE to execute the softwareupdate by following the instructions displayed.

HINT!

A softwareupdate will extinguish the previous software-version! Therefore learn more about the functional scope of the new version before the update.



After the successful update start the system once more by switching the »CALL button« up. The system start as well as the now following system check should be executed automatically and without fault. In the fourth line of the display you can see for a moment the designations of the new program and of the current versions of the coprocessors active and, at the end of the fourth line, the program memory used.

- ▶ **F→** The program stored in the flash memory is being executed.
- ▶ **E→** The program stored in the EPROM is being executed.

If the program stored in the flash-memory is uploaded inspite of the EPROM plugged, you will have to check whether the EPROM is properly plugged and whether it really contains a program with the type-designation 38D/X/S-yy (see sticker). Every EPROM is provided with a sticker stating the software version. The designation key is given below:

e. g. EPROM-designation: 38D-14.02a

3 = Serie 300

8 = for target hardware:

1 / bp300

2 / free

3 / FDG

4 / bp302 with CDA-01

5 / bp302 with CDA-02/03

6 / CCP-01

7 / bp115

8 / bp117 / 304 / 306

9 / free

D = designation of main version:

D / standard main version (not modified)

S / special version (tailor-made differing from standard)

X/ updating intermediate version (becoming D-Version lateron)

other letters stand for the language of the version (E/S/F ...)

14 = Key of the year the program was established in:

14 / 2004

15 / 2005

16 / 2006 etc.

02 = current version

a = current sub-version

By means of the software »BOOT306« it is possible to do a software update via the data remote transmission interface. To get backup for the use of this program please contact the service department of BÖHNKE + PARTNER.



HINT!

You can use the same program version starting with 38-.. for all devices bp117/304/306.

5.7.11 Control System bp306 and Frequency Inverter Together in One Cabinet

The control cabinet is made of painted sheet-steel. It is either bolted to wall-mounted fish-plates by threaded bolts or mounted onto socles or structures standing on the floor.

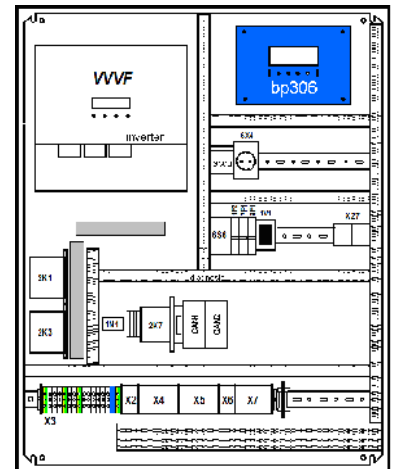
The cabinet shall stand upright in a way that the louvers are free. Please see to sufficient sound-proofing, if the cabinet stands in a critical building. It is possible to order cabinets with sound-proof contactors and installation plates inside.

The sound of our standard control cabinets containing a control unit bp306 was measured with cabinet doors closed from a distance of 1 m and in a height of 1,6 m and turned out to be approx. 55 db(A). This comes inbetween the sound levels of a turned down radio [40 db(A)] and a normal conversation [60 db(A)].

The cable entry is at the bottom of the cabinet. Use the correct cable glands. The cable duct (optional) for the ingoing lines and cables can be removed if necessary for better letting them in.

Control cabinet:

- enclosed (DIN 41488)
- structured paint RAL 7032 (grey)
- installation plate with cable duct
- mains contactors insulated by rubber-bonded metal buffers
- protection class IP 54
- filter protection, if required
- Door lock: triangular grater or special lock
- wall-mounted
- bottom cable-inlet
- dimensions:
 - 800 x 800 x 300 mm by standard
 - 800 x 1000 x 300 mm in case of thyristor-control
 - 1000 x 1200 x 300 mm with VVVF-control integrated
- mounted on rubber-bonded metal buffers, by option



▲ **Picture 12**

Standard control cabinet containing bp306 as well as frequency inverter.

5.7.12 Easy Service Thanks to Clear Layout

On the base plate the cables are layed according to industrial standard. Incoming lines can be strapped in the cable duct. Every terminal of the processor is connected to a separate terminal strip arranged at the bottom of the control cabinet. The control components are arranged on a zinc-plated installation plate. The dimensions stated refer to a standard configuration of elevator plants with eight or more landing call stations and with a main drive power of max. 15 kW. Plants with a higher power can be supplied on demand.

5.7.13 Control Cabinet with bp306

Control cabinet:

- ▶ structured paint RAL 7032 (grey)
- ▶ installation plate with cable duct
- ▶ protection class IP 54, with air-filters as an option
- ▶ main contactors on rubber-bonded-to-metal buffers (optional)
- ▶ dimensions: 800 x 800 x 210 mm
- ▶ door lock: triangular grater,
- ▶ wall-mounted
- ▶ cable inlet at the bottom

Mains voltage

- ▶ 3 x 230 up to 500 V AC 50 cycles N PE

Safety circuit

- ▶ 230 V AC

Mains power pack (integrated)

- ▶ Power 70 VA resp. 130 VA
- ▶ Control voltage 24 V DC / 2,5 A resp. 5 A
- ▶ Electronics voltage 5 V DC

Rectifier

- ▶ Brake (rope-traction) 180 V DC / 4 A
- ▶ Locking (optional) 180 V DC / 4 A
- ▶ Valves (Hydraulics) 180 V DC / 4 A

Contactors:

- ▶ Nominal current 14 A
- ▶ Power 7,5 kW AC 3-phase
- ▶ Make: Telemecanique (other makes as on option)

Terminals:

- ▶ Make: Weidmüller or WAGO

Positive temperature control

- ▶ Integrated in bp306
- ▶ PTC threshold values normal operation < 2,2 kΩ;
 thermistor tripping > 2,7 kΩ

Battery-powered auxiliary power supply unit BHG-12

- ▶ 12 V DC, including monitoring of cabin illumination voltage

Control system

- ▶ System-modul bp306, 32-Bit multi-processor system

Earth leakage circuit breaker (integrated)

- ▶ For releveilling and doors starting to open during slowing-down
(like SMZ-04)

Well-teaching system

- ▶ Magnet switches,
- ▶ Absolute encoder,
- ▶ Other encoding systems, if desired

Inspection control unit (optional)

- ▶ Casing made of metal or impact-proof plastic
 with sufficient terminals
- ▶ Control-elements integrated in the pear-shaped control stick

Documentation

- ▶ Circuit diagram (DIN A4 can be copied)
- ▶ Legend of the operation elements on the circuit diagrams
- ▶ Part list concerning control unit and port assignment
- ▶ Description of CPU and program summary
- ▶ Description of general operation
- ▶ Documentation for acceptance tests of bp306, including current
 terminal assignment list
- ▶ Description of the safety circuit

Standards and Safety Regulations

- ▶ EN 81, SIA, ÖNORM, DIN, VDE, VBG 4, TRA

5.7.14 Standard Execution

Layout

The system bp306 is supplied in a ready-for-installation status, mounted on a stable aluminium plate. The electronic unit consists of the stabilized power pack, the power circuit board and the computer-board, safely joint and wired. Every signal is lead out by plug-terminals or standardized plug-connectors.

Dimensions

W x H x D 270 x 170 x 180 mm

Power Pack (integrated)

Control voltage: 24 V DC / 2,5 A resp. 5 A

Electronics: 5 V DC / 2,0 A

Overload protection, power fail

Pre-Control

Interface-relays selecting the mains contactors

Safety circuit monitoring

230 V AC electronic, TÜV-inspected (German Association for Technical Inspection)

Positive-Temperature Control

Monitoring every common PTC-thermistor

System control

Main processor Motorola, 32-Bit Microprocessor LC 68302

2 Co-processors Fujitsu, 16-Bit Microprocessor LX16-Family

LC-Display (Integrated)

Alphanumerical, 4 lines of 20 characters each, illuminated.

Serves for maintenance and diagnostics purposes and supports you in programming.

Start And Operation Time Counter

Integrated in bp306 by default

Operation Elements

Four operational and programming buttons (END, -, +, CR).

Functions, time intervals and processes within the elevators may be set at free choice. Controls may be interlocked by codes.

22 Inputs

24 V DC, optodecoupled, input current approx. 10 mA

16 Outputs

24 V DC, optodecoupled, short-circuit resistant, overload resistant, output current 280 mA, power 6 W

Relay Outputs (Programmable)

Two relays, contact 230 V AC / normally open contact

Two relays, contact 230 V AC / normally closed contact

Four relays, contact 230 V AC / make-break contact

Doors

Integrated selection of three electronic door drive units

Safety Circuitry

For relevelling and doors starting to open during slowing-down (e.g. SMZ-04)

Interfaces Integrated

Data Comm Interface Interface (RS232) for peripheral modem or comserver

Absol.encoder interface Interface (RS485) for absolute encoder (AWG-05)

DCP Interface Interface (RS485) for communication with frequency inverter

CANopen-Interfaces Interface (CAN High Speed) for communication with all components according to the CANopen Application Profile CiA-417

Optional Interfaces

RS232, RS422, RS485 with different protocols for transponder, building automation, touch and LCD monitors, gateways for LONworks and internet services.

6 Installation and Commissioning

Please thoroughly read the security information and warnings before starting installation and commissioning and pay attention to every warning label at the apparatus. Make sure that the warning labels are clearly readable and replace missing or damaged ones.

CAUTION!

For safe operation of the device it is necessary that skilled personnel will properly install and commission it in adherence to the warnings given in this manual. It is especially important to observe not only the general and local installation and safety regulations concerning the work with power engineering systems (e. g. VDE), but also those for the proper use of tools and personal security devices .

Make sure that there is no hindrance to the cooling air flowing through the vent slots and clear an area of at least 100 mm in front of them.

Prevent undue vibrations and shock waves from the device.



6.1 Conditions for Storage and Operation

ATTENTION!

Improper conditions of storage and operation can damage the device and endanger persons!

- Storage temperature: -20 °C to 70 °C,
- Operative temperature: 0 °C to 60 °C,
- The environmental temperature around the control cabinet may range between 0 °C and 40 °C. If the operative temperature falls below 5 °C, it can occur that the LC-display is not clearly readable anymore. If the maximum admissible temperature is exceeded, the control cabinet is to be cooled down (for up to 60 °C a fan, for higher temperatures a cooling aggregate). Keep vent slots clear!
- Aggressive mediums, dust, fog, water or wetness are to be prevented from the components. The control cabinet should therefore correspond to not less than protection class IP54.
- Prevent all components from being dewed !
Example: formation of dew in a damp machine room after switching out the control.
- In critical environments it is to be seen to sufficient sound proofing towards the building.
- Our control systems are laid out for a primary voltage of 230 V AC 50 Hz.



- If an earth leakage circuit breaker is integrated in a control system that comprises a frequency inverter as well, make sure that these current-operated circuit breakers are sensitive to all currents. It is not allowed by DIN VDE 0160, 5.5.3.4.2 to use any other current-operated circuit breaker, as a dc-component within the leakage current might prevent activation of the circuit breaker.
- The maximum admissible current operating this all-current-sensitive circuit breaker must not exceed the value $I_{\Delta N}=0,3 \text{ A}$.

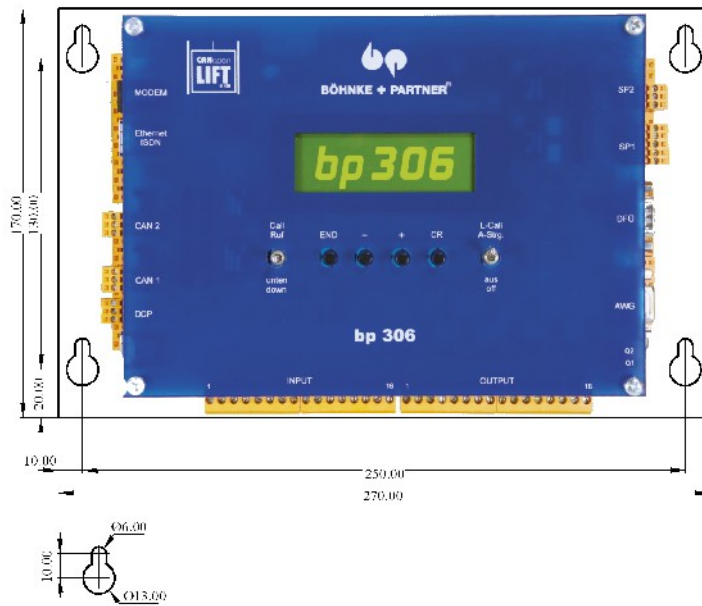
6.2 Preparation



INFORMATION!

- BÖHNKE + PARTNER check the entire elevator control unit before supplying it. We document the status of supply in the circuit diagrams and in the protocol of the basic and service menu.
- Each control unit is accompanied by circuit diagrams and a technical documentation identifiable by the nonambiguous control unit number.
- Every 24 V DC control signal (in- or output) is galvanically isolated from the control electronics.
- The control unit is to be installed in adherence to our circuit diagrams.
- The 24 V DC control lines and the data lines RS232, RS485, CAN, LON, Ethernet and telephone are to be laid separately from the load lines!
- While installing the control unit see to it that you adhere to the technical features that have been specified in your order and formed basis of production.

6.3 Installation of the Control System bp306



The control system bp306 is supplied on an aluminium base plate. It has got four drill holes for fixation. The plate may be fixed through these holes only.

6.4 Mounting of the Control Cabinet

BÖHNKE + PARTNER supply your elevator control unit in a control cabinet. According to your requirements it is either wall-mounted or standing on the floor. Anyhow, please fix your control cabinet as per the instructions enclosed.

6.5 Mounting of Terminal Box on Top of Car

The terminal box on the car is to be fixed in a way that you can easily and safely reach the inspection control switch and possibly available sockets and properly insert the travelling cable.

6.6 Mounting of the Absolute Encoder

The absolute encoder places the absolute position and speed of the car at the disposal of every bus participant. Mounting is possible either in the well head or on top of the car. A toothed belt couples it to the car in a slippage-free way. Mounting at the speed governor is possible as well. In that case the toothed belt can be omitted, but on the other hand a magnet switch is to be inserted that will have to correct the slippage. Please read from the instructions enclosed how to mount the absolute encoder.



▲ Picture 13

The control system is supplied in a cabinet, which is to be either wall-mounted or on a socle on the floor.



▲ Picture 14

Wall-mounted cabinets are equipped with fishplates at their back, by which they are to be fixed to the wall.

6.6.1 Fixation Kits for Absolute Encoder

There are different fixation kits available for the different ways of mounting the absolute encoder in the well resp. on the car.

Type S 100

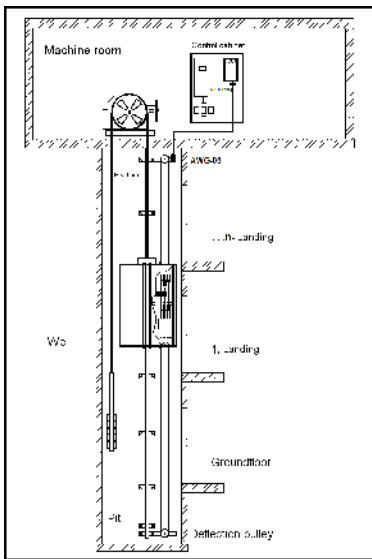
Absolute encoder type AWG-05 with fixation kit in the well, comprising big toothed reel 10 mm wide, jagged flanges, suitable for travel heights of up to max. 60 m and speeds of up to max. 4,0 m/s

Art.-Nr.: 287-051-003

Type K 105

Absolute encoder type AWG-05 with fixation kit on car with big toothed reel 10 mm wide, jagged flanges, suitable for travel heights of up to max. 180 m and speeds of up to max. 4,0 m/s

Art.-Nr.: 287-051-004



Picture 15

The absolute encoder is driven in a slippage-free way by a toothed belt.

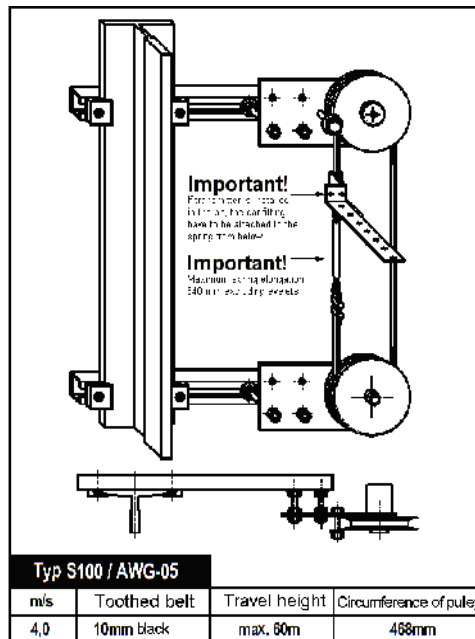
Toothed Belt

Z 10s 10 mm, jagged flanges, black, for S 100, K 105

Art.-Nr.: 3020-130-100

6.6.2 Mounting in the Well

The absolute encoder is mounted to the guide rail in the well. It is driven by a toothed belt that is coupled to the car in a slippage-free way via a deflection pulley.



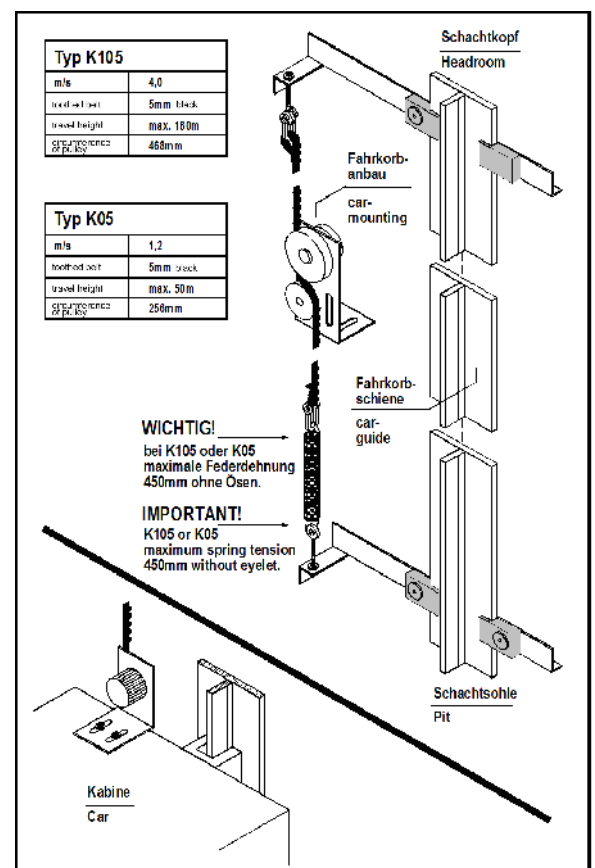
Picture 16

Fixation kits for mounting in the well (Type S100).

6.6.3 Mounting on the Car

A variant of the above-mentioned mounting is the mounting of the absolute encoder on the car. In this variant a toothed belt tightened from the well head down to the well pit drives the absolute encoder. On one hand you have got the advantage of a shorter toothed belt, on the other hand the

disadvantage that the toothed belt will generate a rolling sound when the toothed reel runs along at high speed. This can however be reduced by a special layer on the belt-pulley.



Picture 17

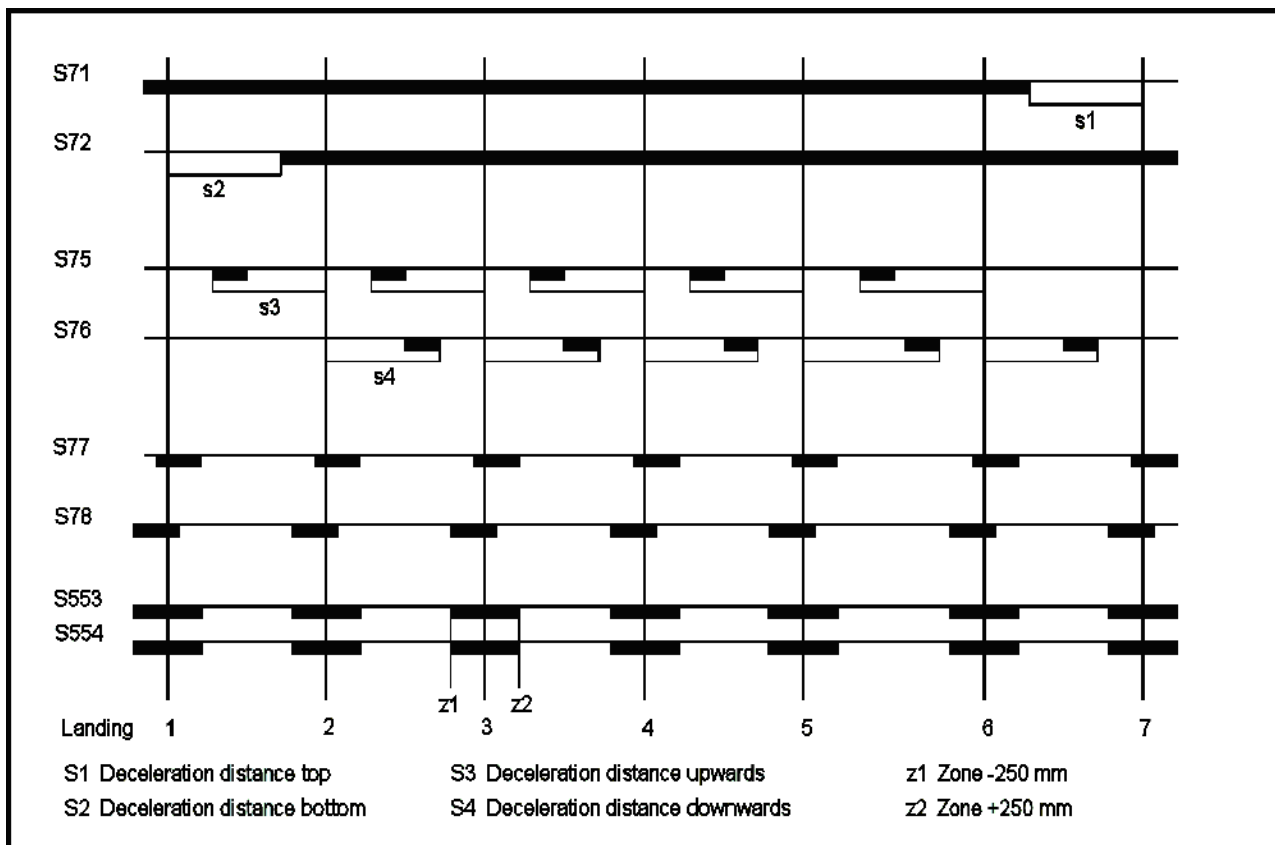
Fixation kits on the car.

6.7 Mounting of the Magnet Switches

If magnet switches are to be used, they are to be mounted on the car in a way that they will pass by the magnets at a distance of approx. 5 mm while the car is travelling through the well.

Definition of the Switches:

S71	correction switch top	normally closed
S72	correction switch bottom	normally closed
S73	relevelling switch up	normally open
S74	relevelling switch down	normally open
S75	pulse generator up	normally open
S76	pulse generator down	normally open
S77	flush-level switch up	normally open
S78	flush-level switch down	normally open
S553	zone switch "A"	normally open
S554	zone switch "B"	normally open



Picture 18

Sample of a pulse diagram by magnet switches.

7 Electric Installation

7.1 Preparation

Please thoroughly read the security information and warnings before starting installation and commissioning and pay attention to every warning label at the apparatus. Make sure that the warning labels are clearly readable and replace missing or damaged ones.

CAUTION! DANGER FROM VOLTAGE!

- Make sure that the devices you work on do not carry current. Disconnect the plant from the voltage (according to the circuit diagram).
- Before executing any work on the elevator control ascertain that it does not carry any voltages of $> 50 \text{ V AC}$.
- Plugs must not be inserted in sockets as long as the according devices are not switched off.
- Pay attention to the rules concerning the handling of delicate electronic printed-circuit boards (protection against electrostatic loading)!
- Before connecting the device to the supply voltage, check whether the indications on the type label of the elevator control correspond to the values of the connected load.
- Electrical installation is to be done in adherence to the general installation regulations viz:
 1. VDE 0100 Bestimmung für das Errichten von Starkstromanlagen mit Nennspannungen bis 1000 V (rules for the installation of power engineering systems with nominal voltages of up to 1000 V, from the association of German electricians engineers).
 2. DIN EN 60204-1 (VDE 0113) Bestimmung für die elektrische Ausrüstung von Be- und Verarbeitungsmaschinen (rules for the electrical equipment of processing machines, from the association of German electricians engineers).
 3. DIN EN 50178 (VDE 0160) Ausrüstung von Starkstromanlagen mit elektrischen Betriebsmitteln (equipping power engineering systems with electric operating resources, from the association of German electricians engineers).
 4. Legal regulations for the prevention of accidents, such as for example BGV A2.
- If the elevator control unit or related components are used in special environments (e. g. ex-area), it is to be ascertained that the relevant standards and regulations are adhered to.



- If the elevator control unit disposes of an uninterruptable power supply (USV), it will not be sufficient to disconnect the unit from the voltage, but you will separately have to switch off the USV.

7.2 Interference Suppression and Hints

Every industrial, electronically controlled apparatus (PC, microprocessor, computer, SPS) can be influenced by interferences if it is left without protection. Interferences can be caused by external systems such as for example voltage fluctuations in the feed line and control pulses in the power circuits of the frequency inverter. BÖHNKE + PARTNER take every thinkable common interference suppressing measure in the production of elevator control units. The components used are not very sensitive against interferences from the environment. The control units have been designed for applications in industrial environments where high-valued electro-magnetic interferences are to be anticipated. In general, an operation without any risk and interference can be warranted by proper installation. If nevertheless difficulties arise, adherence to the following directives will possibly be useful. It might be particularly efficient to earth the reference potential of the plant (0 V) in the control unit, as described below.



INFORMATION!

- BÖHNKE + PARTNER check the entire elevator control unit before supplying it. We document the status of supply in the circuit diagrams and in the protocol of the basic and service menu.
- Each control unit is accompanied by circuit diagrams and a technical documentation identifiable by the nonambiguous control unit number.
- Every 24 V DC control signal is galvanically isolated from the control electronics.
- The control unit is to be installed in adherence to our circuit diagrams.
- The control lines and the bus lines are to be laid separately from the load lines!
- While installing the control unit see to it that you adhere to the technical features that have been specified in your order and formed basis of production.
- By all means adhere to the instructions of the manufacturer of the inverter regarding EMC.
- Should you have any question concerning the EMC-directives please contact our service team, who will be pleased to help you.
- Furthermore, please pay attention to the directives concerning cable shielding (chapter 7.3)

Those are the measures to be adhered to:

- bp306 exclusively serves as information processing device within the elevator control system. Every control signal is processed by positive circuitry or via the CAN-Bus. The Safety Rules TRA and DIN EN 81 are not restricted by the electronic information processing.
- The control unit has been designed, manufactured and tested. The relevant regulations for the commissioning of electric control unit and operating devices have to be adhered to by you. You will also have to follow the local lightning protection rules. Every elevator control unit is accompanied by circuit diagrams and a technical documentation that are unambiguously identified by the serial number of the elevator control unit.
- Every device of another make requires you to precisely adhere to its manufacturer's mounting and installation instructions.
- To conform to the EMC-directives, you have to wire an appropriate one-phase mains filter in the 230 V AC control circuit.
- The control lines are to be laid separately from the load lines in separate cable ducts. Crossing lines are to be laid at an angle of 90°.
- Control devices are always to be connected by applying choke, filter and shielded cables and according to the mounting and installation instructions of the manufacturer.
- Make sure that all the devices contained in the cabinet are properly earthed via short earthing lines with big cross sections that are all connected to a mutual earthing point or earthing bus. It is of particular importance that every control device connected to an inverter (e.g. a speed encoder) disposes of short lines with a big cross section and is connected to the same earthing point as the inverter itself. Preferable are flat lines (e.g. metal brackets) as they have a lower impedance at high frequencies.
- Use shielded or reinforced cables for load lines between drive unit and inverter resp. control unit, and connect the shielding/reinforcement to the earth at both ends.
- Data lines (group, data remote transmission, printer connection etc.) are generally formed by shielded cables. The shielding of data lines should be connected to the earth at one end.
- Mounting rack : zinc-plated sheet steel enabling large-surface earth connection to all control components.
- Interference-proof structural elements improve the immunity against environmental interferences.
- The car is to be connected to the earth by the green/yellow line of the travelling cable.
- Idle lines of the travelling cable shall be connected with one end to the earth at the control cabinet.

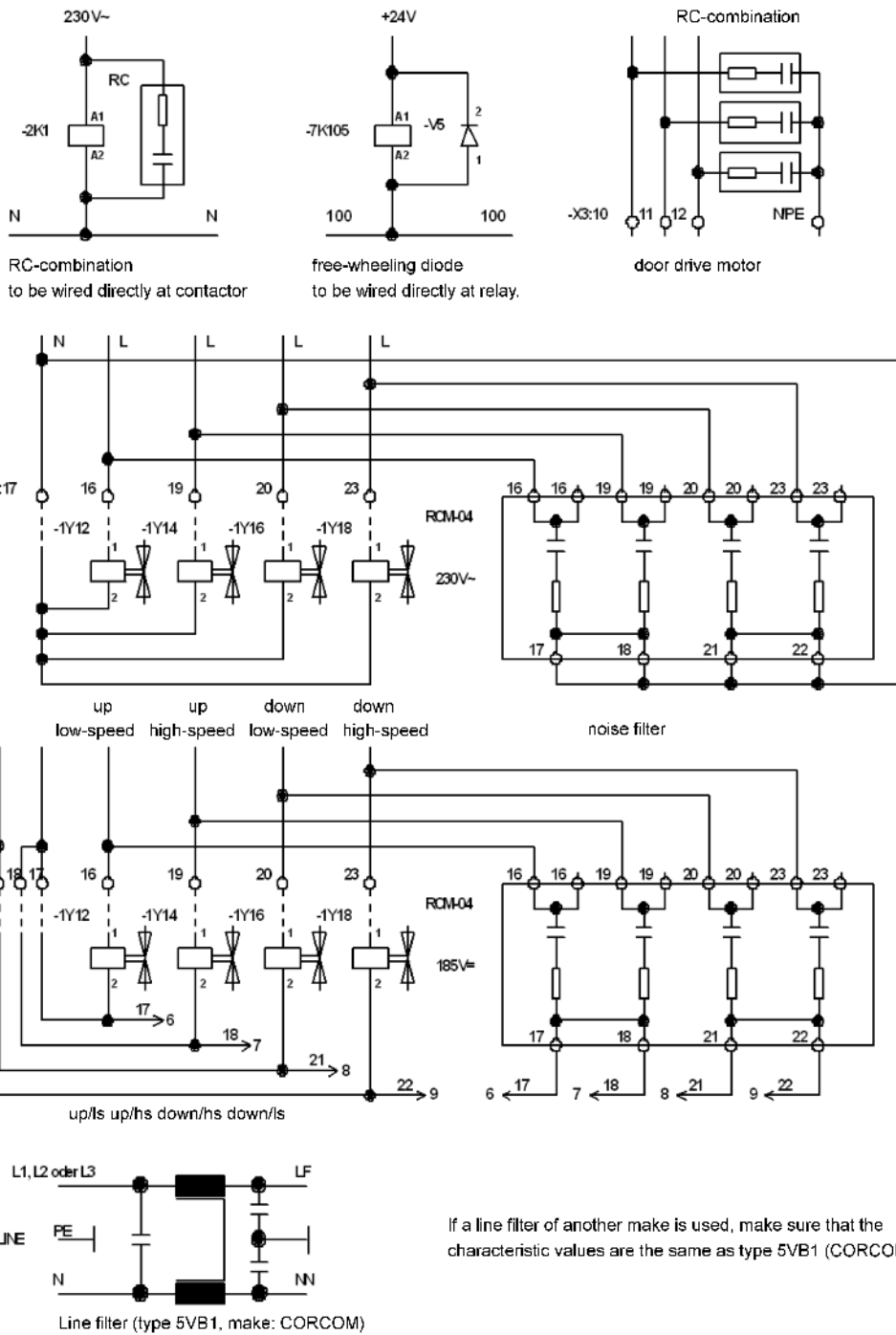
- The components of the control unit conform with the regulations of DIN EN 81 (TRA) as well as VDE 0100 / 0101 / 0551 / 0660 and BGV A2. The control cabinets conform to the installation standards VDE 0660 / part 500.
- Mains and auxiliary contactors used in the control unit comply with DIN EN 81 part 1, 13.2, (TRA 260.82) as well as VDE 0660, at least however assembly-class D3.
- Voltage fluctuations are admissible, if they range within a tolerance of (+10 %, -20 %) normally guaranteed by the utility company.
- Malfunctions caused by an unadmitted voltage rise cannot be accused to the liability of the manufacturer.
- If the owner adds further coils (inductivities) at his own discretion, it will be of utmost importance that these coils are interference-proof as well.
- D.C.-powered inductivities such as for example in contactors, relays, brake magnets, lock magnets and hydraulic valves are required to be equipped with a diode (1000 V / 1 A), antiparallel and as near as possible to the coil (BÖHNKE + PARTNER use a free-running diode).
- A.C.-powered contactors, relays, brake magnets, lock magnets and hydraulic valves are required to be equipped with a RC-combination pitched on the type of coil, in parallel and as near as possible to the coil (the RC-combination of BÖHNKE + PARTNER is universally applicable).
- A.C.-powered door operators, braking and locking motors are to be equipped with a RC-combination pitched to the motor type, in parallel and as near as possible to the motor coil. The RC-combinations are radially connected to the motor coil (the RC-combination of BÖHNKE + PARTNER is universally applicable).
- Interference suppression means are to be properly installed.

7.3 Connection of Shielded Cables

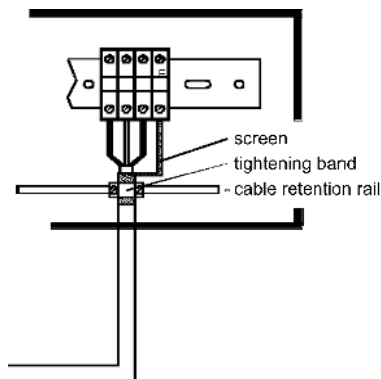
To achieve an optimal electro-magnetic compatibility (EMC) of the elevator plant, all shielded cables have to be connected according to the following pictures, provided that they have not been manufactured as EMC-plug connectors .

Suggested arrangement of the components in the control cabinet,
e.g. wiring with cable ducts.

Pay attention to different wiring with 230V~ and 24V=!



Picture 19
Circuit Diagrams of Interference Suppression



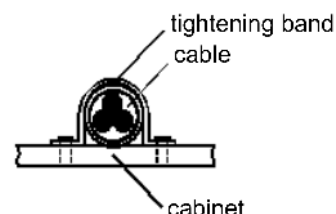
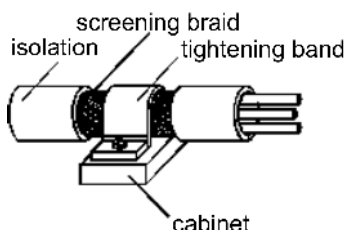
▲ Picture 20
Example of the connection of a shielded cable

INFO!

It is not sufficient to twist the cable shielding and clip this pigtail to PE-potential. For a good EMC it is important to connect the shielding with its full surface.

If the user connects further shielded cables at his own discretion, it will be of utmost importance that he connects them as shown on the pictures!

Please pay attention to the EMC-instructions given by the manufacturer of the inverter. For any question concerning the EMC-legislation please contact our service team who will be pleased to advise you.



▲ Picture 21

The shieldings are to be connected with their full surface to the PE-potential by a cable resp. pipe clip.

7.4 Designation of Circuit Diagrams

BÖHNKE + PARTNER define the different components in terms of functional groups. We abstained from pressing the designations in a stern system. Thanks to issuing the circuit diagrams by the CAD-system we get a high flexibility in designating the circuit diagrams and the packing lists. Each component is directly designated in the circuit diagram with reference to function as well as project, i.e. in a specific way for each customer.

Meanings of the Abbreviations (Functional Groups):

- A - Modules makes by BÖHNKE + PARTNER, Inverter
- B -
- C - separate condensers
- D - Diodes (e. g.: free-running diodes of D.C.-relay)
- E - Illumination (230 V AC – 240 V AC [e. g.: E5 = car light])
- F - Fuses (e. g.: F2 = control fuse)
- G - Incremental encoder, tacho-generator (analogue, digital)
- H - Analogue signals, visible and audible (6 V DC - 24 V DC [e. g. H7 = alarm buzzer in the well])
- I -
- J -
- K - Main and auxiliary contactors, relays (e. g.: K1= mains contactor up)
- L - chokes, coils
- M - Motors, fans
- N - Mains filter
- O -
- P - Digital indicators
- Q - Motor protection switch
- R - Resistors (e. g.: R5 = positive-temperature-control thermistor)
- S - Switches
- T - Transformers (e. g.: T2 = control transformer)
- U -
- V - Rectifiers
- W -
- X - Terminals, terminal strips
- Y - Magnets (brakes, locks, valves)
- Z -

Examples Of Designations In Circuit Diagrams:

2K5 contactor K5 on page 2...

4S71 switch S71 on page 4...

On page 2... (e. g.: page 21) a »star« may be found as a designation together with the corresponding contactor-symbol, thus defining contactor K5 as a star-contactor.

On page 4... (e. g.: page 40) »correction up« may be found as a designation together with the corresponding switch symbol, thus defining switch S71 as a »correction switch up«

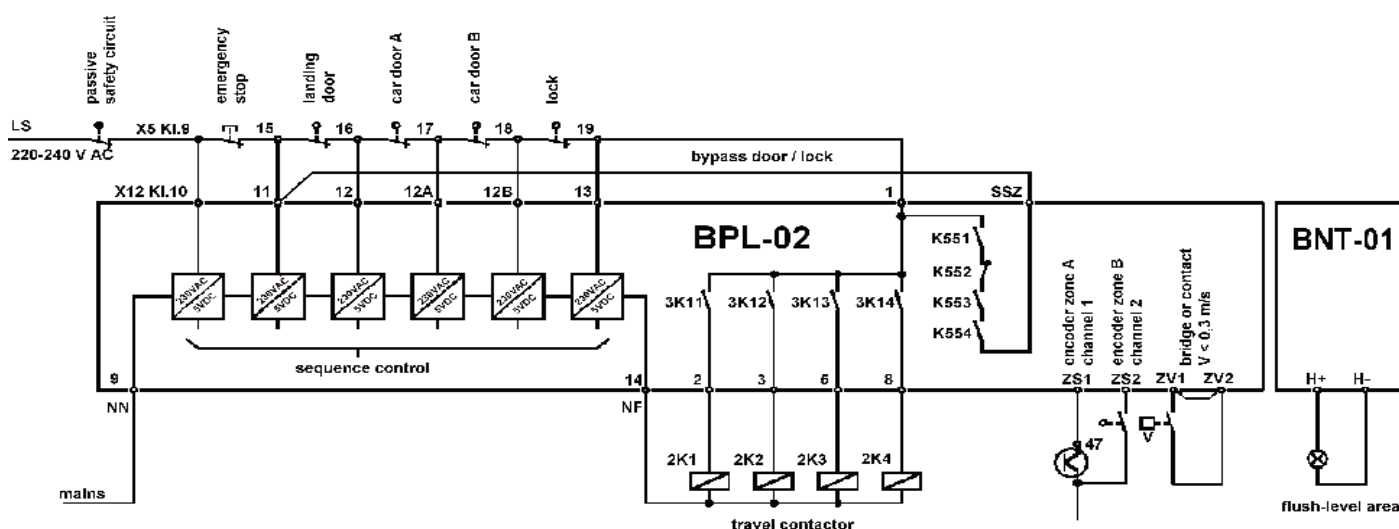
The CAD-software applied by BÖHNKE + PARTNER disables the duplication of designations.

Once the safety devices are activated they will prevent the elevator from starting resp. stop a travelling car down.

- ▶ Closed position of maintenance door and emergency exits,
- ▶ Locked status of car doors,
- ▶ Locked status of landing doors,
- ▶ Closed position of landing doors,
- ▶ Closed position of car doors,
- ▶ Emergency stop switch on top of car, in car, in machine room,
- ▶ Speed governor,
- ▶ Buffer contacts,
- ▶ Emergency limit switches top and bottom,
- ▶ Safety gear,
- ▶ Landing door zone with safety circuitry.

Every travel-contactor and auxiliary contactor of the safety circuit is laid out according to VDE 0660, device class D3. The safety circuit has a signal voltage of 220-240 V AC.

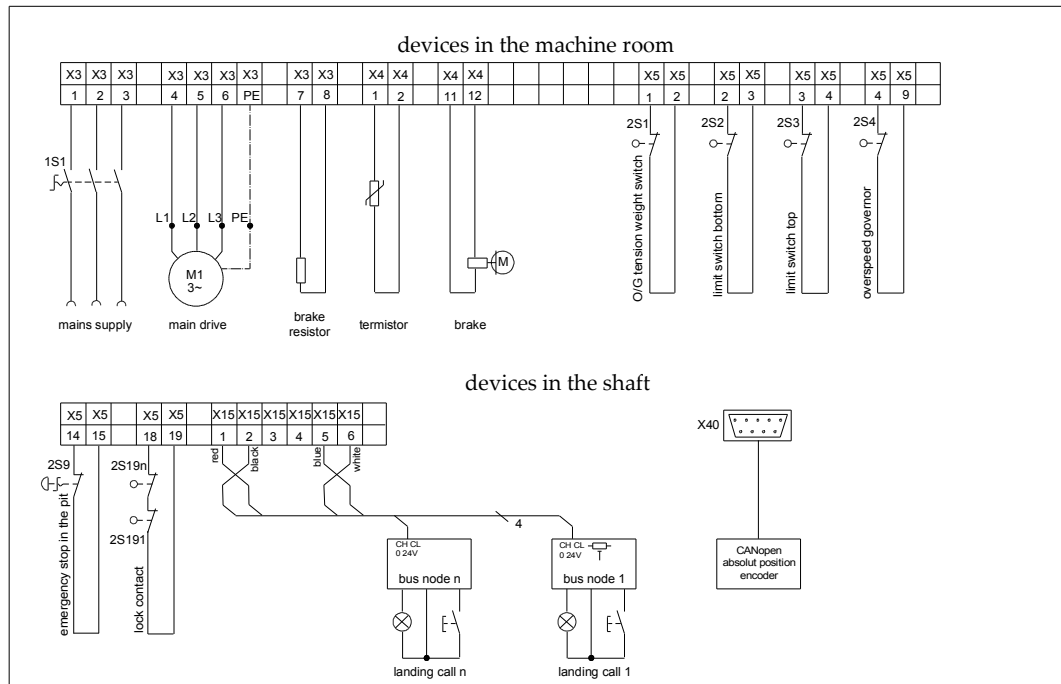
The safety-circuit functions are independent from those of the control system bp306. In case of a malfunction, the operational voltage of the output module for control elements is cut off.



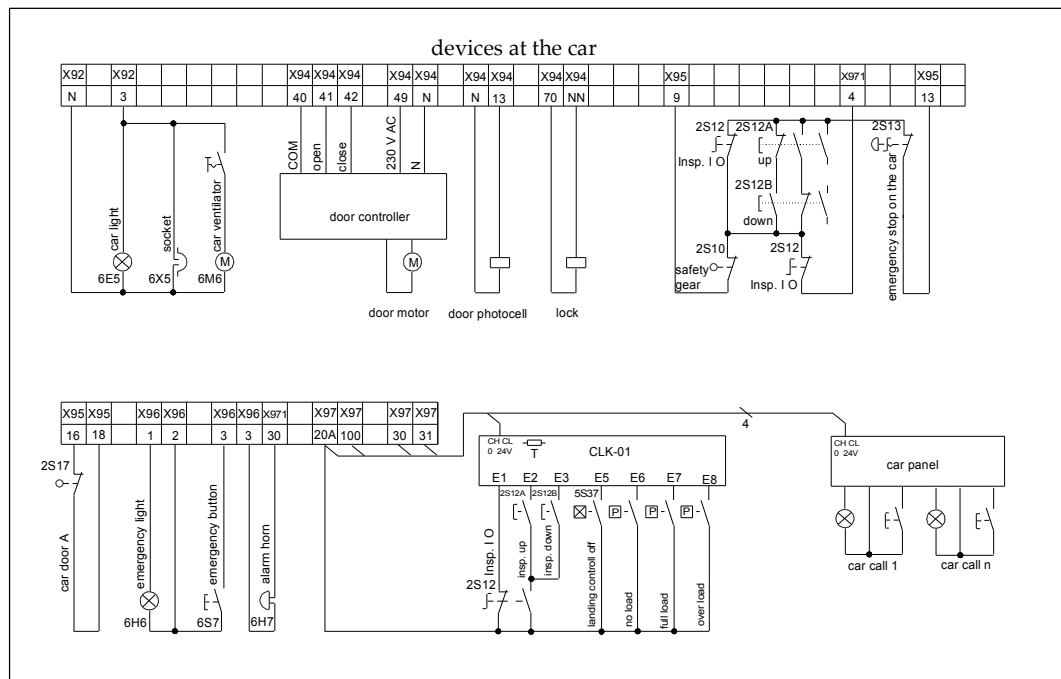
Standard arrangement of a safety circuit related to bp306

Elevator

Wiring of the machine room

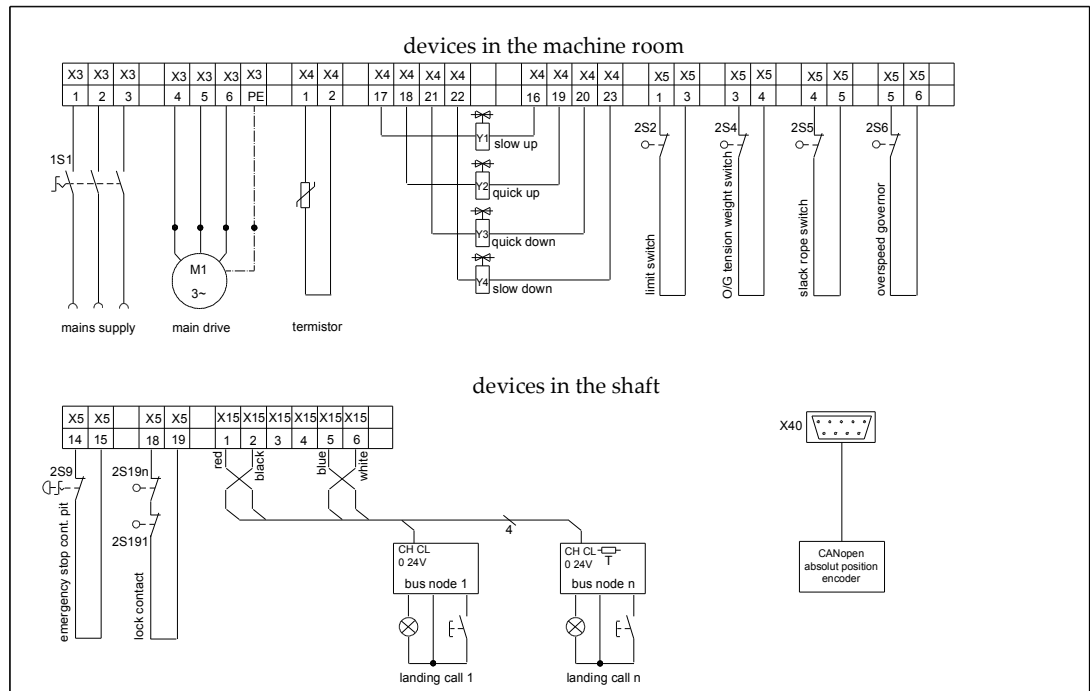


Car Wiring

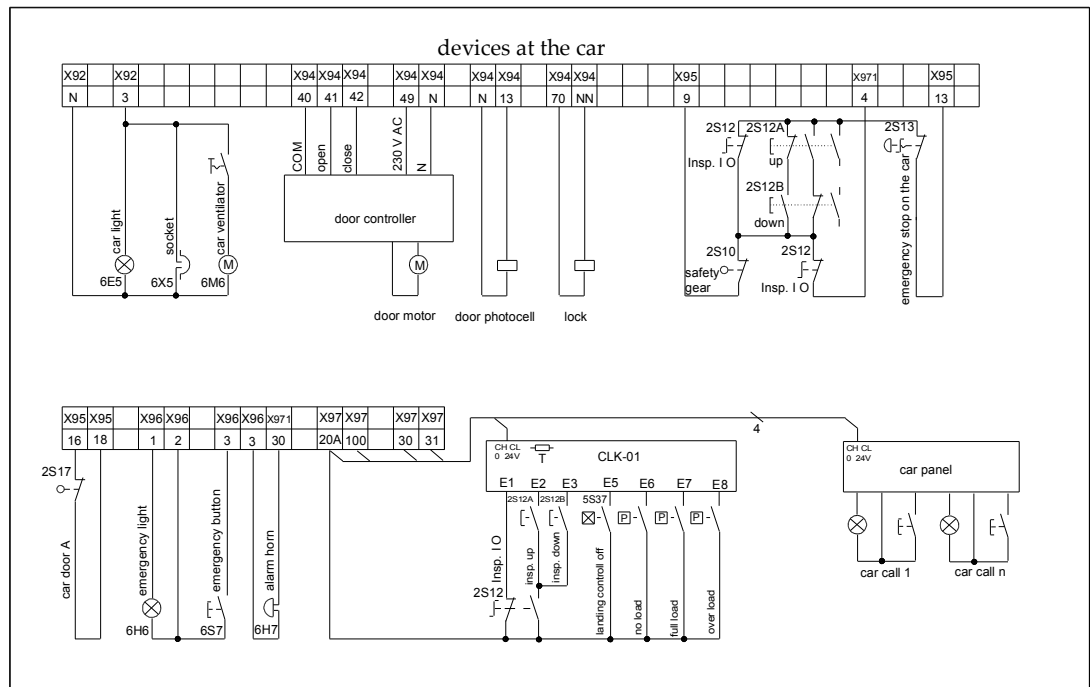


7.7 Sample Circuit Diagram of a Hydraulically Operated Elevator

Picture 25
Wiring of the
machine room



Picture 26
Car Wiring



7.8 Electrical Installation

After having mounted all components, proceed to their electrical installation according to the circuit diagrams. Properly connect all the terminals and adhere to the EMC-wiring directives.

7.9 Installation of the Bus

Elevator control systems bp306 come with the CAN-Bus according to application profile CiA-417. This profile describes the physical parameters of the bus lines as well as the topology. In general there are special rules for the wiring of bus systems.

7.9.1 Electric Bus Medium

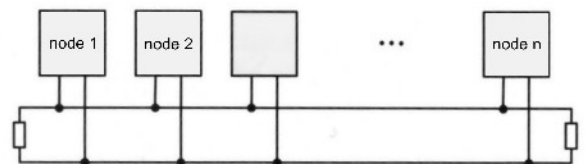
The components corresponding to CiA-417 are subject to a two-wire data communication line. Speaking in bus-terms the components connected are denominated as nodes. Nodes are connected to the bus in parallel. While doing that ascertain that the topology of the bus-line always forms a line. The CAN-high-speed standard (ISO99-2) requires both ends of the bus to be terminated with a resistor (120 Ohm) each. These terminations can be done in different ways. It is possible within some nodes to activate an internal resistance by a DIL-switch or jumper, in other ones a resistor is to be connected to the bus terminals. Read from the the relating manual of every single node how to realize the termination!

The driver-modules used restrict the maximum amount of nodes per bus to 64. If more nodes are required, it will be necessary to use repeaters or gateways (read further down). Furthermore, all nodes connected must have identical baud rates. The baud rate is preset to 250 kBit by network master bp306 at the interfaces CAN1 and CAN2. All the other components make BÖHNKE + PARTNER are equipped with an automatic baud rate identification or have been preset to a baud rate of 250 kBit. Due to the baud rate used, the length of the bus must not exceed 250 m. Stub lines to the nodes must keep below 3 m length.



▲ **Picture 27**

Elevator components that correspond to the application profile CiA-417 may be marked with this logo.



▲ **Picture 28**

The bus ends must be terminated each with a resistor of 120 Ohm.

7.9.2 Colours of the Cables

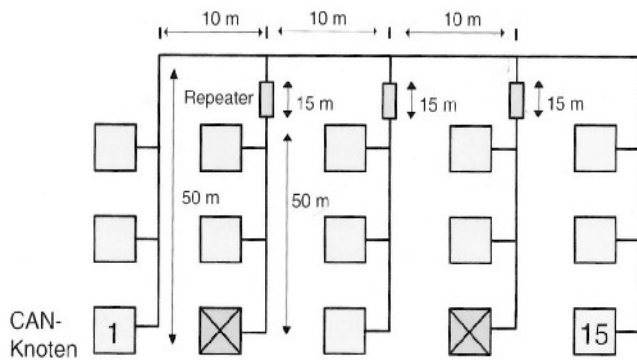
CANopen does not pre-define the colours of the bus lines. To facilitate wiring and fault-finding, we recommend the following colours for the bus lines:

Signal	Description	Colour
CAN_L	CAN-Bus-Signal (dominant low)	blue
CAN_H	CAN-Bus-Signal (dominant high)	white
GND	External electrical ground	black
CAN_V+	External voltage supply (+24 V)	red

7.9.3 Topology of the Network

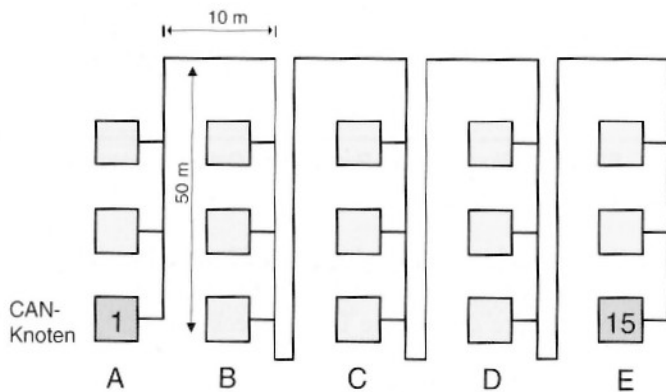
Owing to laws of physics within a bus system, a topology is required. A line-structure is specified for the CAN-bus by CiA-417.

This line structure cannot always be realized in practice. Therefore it is possible to connect further lines via repeater or gateway. Please note that every line coming behind a gateway or a repeater is to be regarded as an independent bus and consequently properly terminated at its both ends.



Picture 29

Additional lines are connected by the use of repeater or gateways.



Picture 30

Nodes are always to be wired in line.

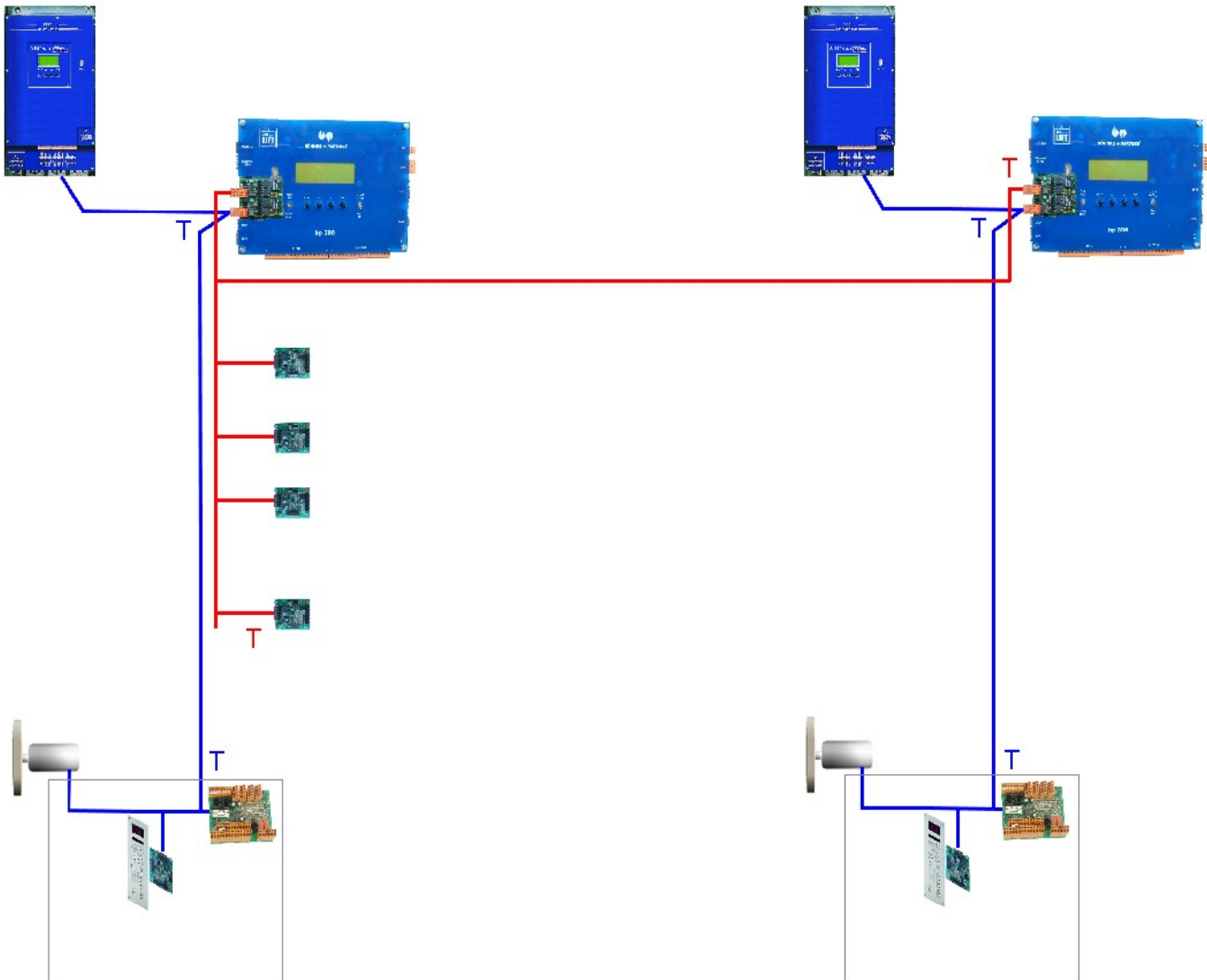
7.9.4.2 Group of 2 Elevators in One Line

On the picture you can see the topology of a bus for the landing calls of a group of 2 elevators in 1 line. As you can see, it is a line structure with properly terminated ends.



INFO!

Pay attention to the terminations while commissioning the elevator. In most cases, an elevator is first put in operation as a single unit and the connection to the group is realized later on. In this case, the terminations are to be adapted (refer to controls of a single elevator).



▲ Picture 32

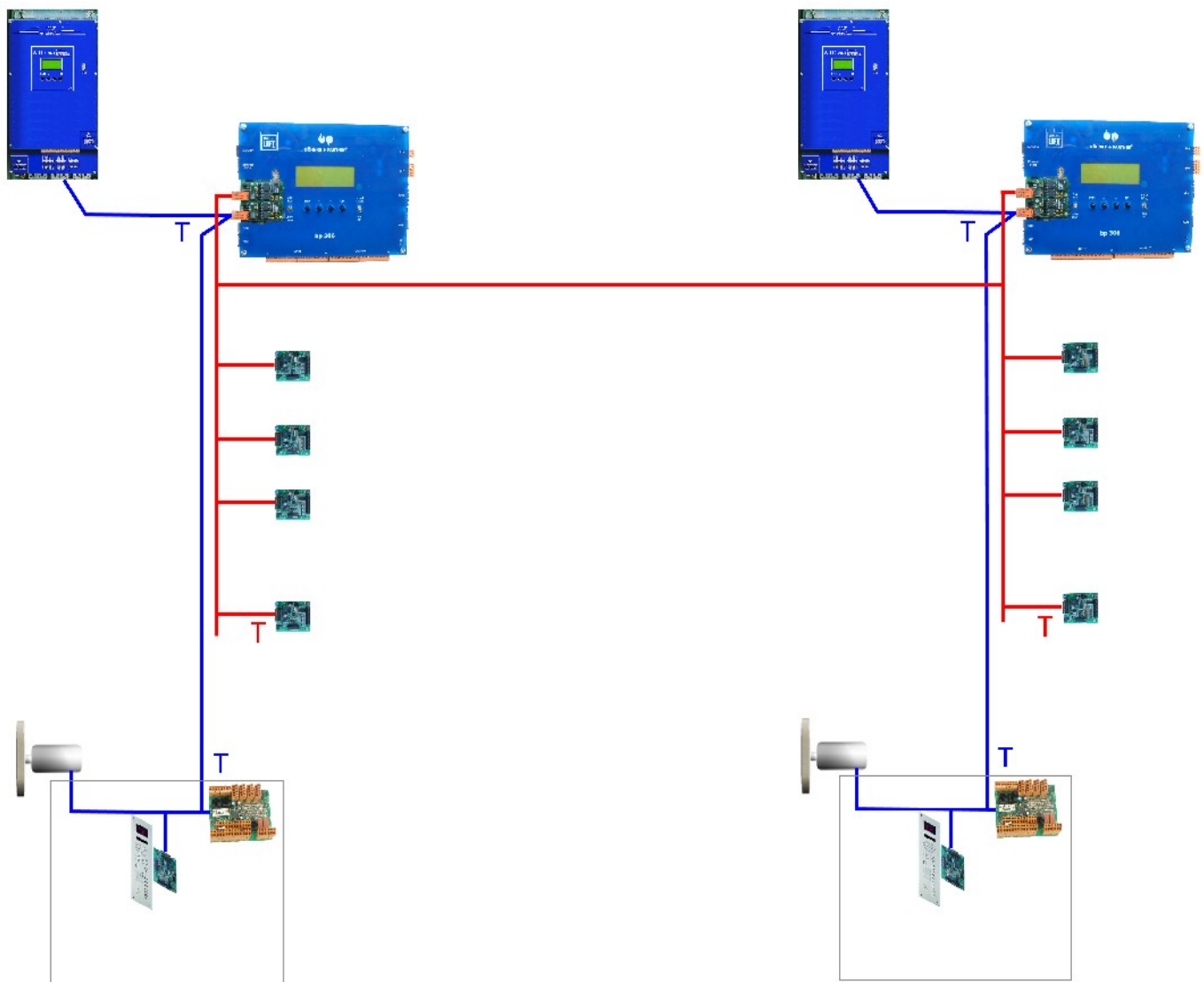
Topology of a group of 2 elevators in one line only.

7.9.4.3 Group of 2 Elevators in 2 Lines

From the picture you can see the topology of a bus for the landing calls of a group of 2 elevators in 2 lines. The line structure is given by the terminations at both ends of the well.

INFO

Pay attention to the terminations while commissioning the elevator. In most cases, an elevator is first put in operation as a single unit and the connection to the group is realized later on. In this case, the terminations are to be adapted (refer to controls of a single elevator).



▲ Picture 33

Topology of a group of 2 elevators in two lines.

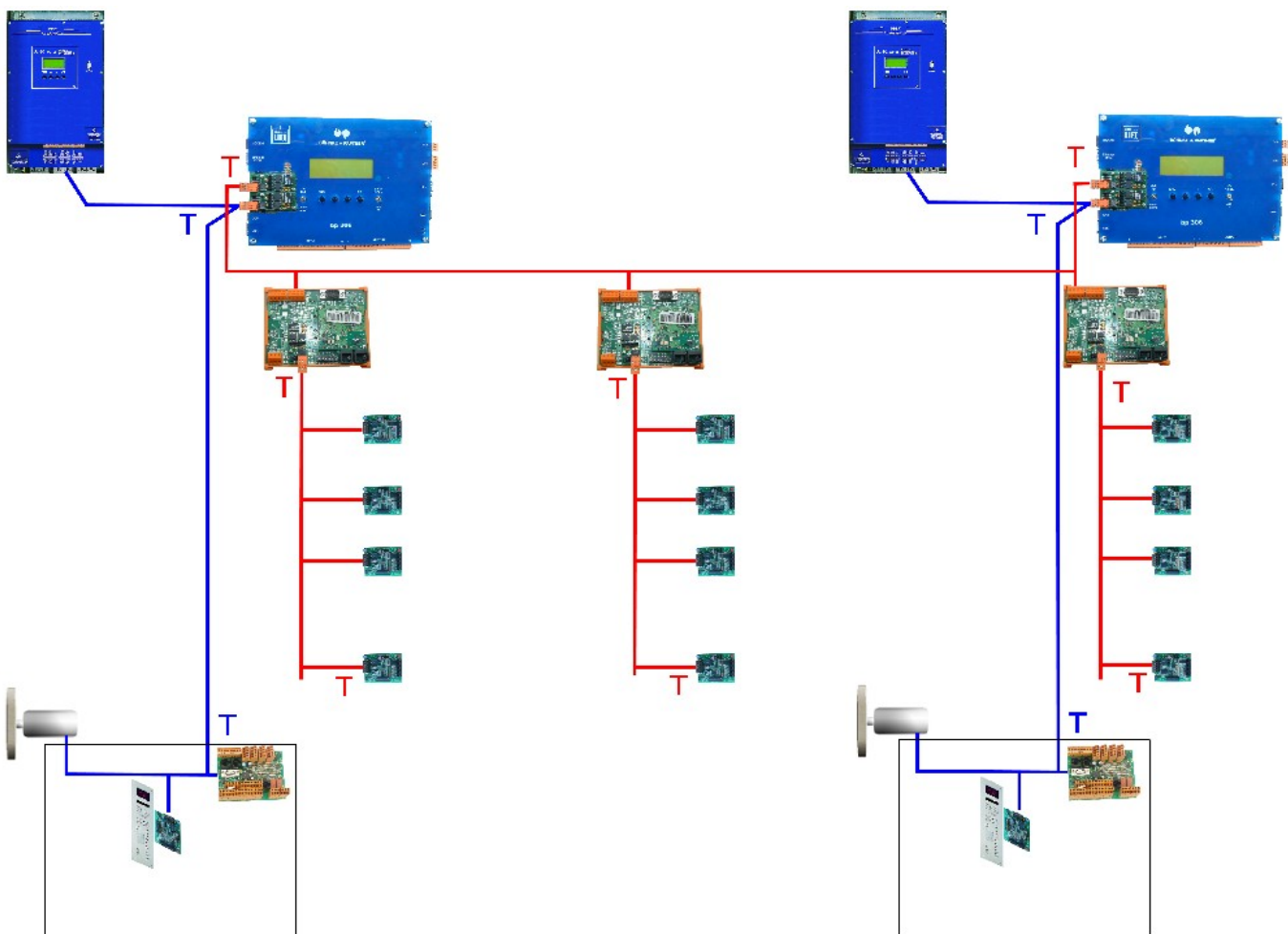
7.9.4.4 Group of 2 Elevators in 3 Lines

From the picture you can see the topology of a bus for the landing calls of a group of 2 elevators in 3 lines. As the line structure cannot be realized for more than 2 lines, gateways are used in order that each single line forms a real line itself. The bus is terminated each at the ends.



INFO

Pay attention to the terminations while commissioning the elevator. In most cases, an elevator is first put in operation as a single unit and the connection to the group is realized later on. In this case, the terminations are to be adapted (refer to controls of a single elevator).



▲ Picture 34

Topology of a group of 2 elevators in 3 lines.

7.9.5 Pin Assignments

The CANopen-Standard stipulates the pin assignments of the most common plug-connectors. The application profile for elevators recommends the following plug-connectors for elevator components:

- D-Sub 9 Pins
- RJ45
- Open-Style Plug-Connector

7.9.5.1 Pin-Assignment of D-Sub Plug-Connector with 9 Pins

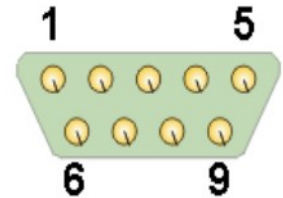
Pin	Signal	Description
1	-	Reserved
2	CAN_L	CAN-Bus-Signal (dominant low)
3	CAN_GND	CAN electrical ground
4	-	Reserved
5	CAN_SHLD	Optional shielding
6	GND	Optional electrical ground (from Pin 9)
7	CAN_H	CAN-Bus-Signal (dominant high)
8	-	Reserved
9	CAN_V+	Optional external voltage supply (+24 V)

7.9.5.2 Pin-Assignment of the RJ45-Socket-Connector

Pin	Signal	Description
1	CAN_H	CAN-Bus-Signal (dominant high)
2	CAN_L	CAN-Bus-Signal (dominant low)
3	CAN_GND	CAN electrical ground
4	-	Reserved
5	-	Reserved
6	CAN_SHLD	Optional shielding
7	GND	Optional electrical ground (from Pin 9)
8	CAN_V+	Optional external voltage supply (+24 V)

7.9.5.3 Pin-Assignment of the Open-Style Plug-Connector

Pin	Signal	Description
1	CAN_GND	CAN electrical ground
2	CAN_L	CAN-Bus-Signal (dominant low)
3	CAN_SHLD	Optional shielding
4	CAN_H	CAN-Bus-Signal (dominant high)
5	CAN_V+	Optional external voltage supply (+24 V)



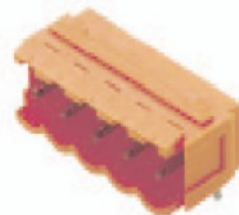
▲ Picture 35

D-sub plug-connector 9 pins



▲ Picture 36

RJ45 socket-connector



▲ Picture 37

Open-Style plug-connector
5 pins

7.9.6 Node-IDs of the CAN-Components

Every CANopen-component can be identified by a node-ID that must be unambiguous within the CANopen-network. If there are two components with identical ID connected to the bus, they cannot be selected by the system.

According to BÖHNKE + PARTNER the node-IDs are assigned as per the following scheme:

Node-ID [dez]	Node-ID [hex]	CAN1 local bus	CAN2 well bus
1	01	bp306 - elevator control unit	bp306 – elevator control unit G1
2	02	drive unit (frequency inverter)	bp306 – elevator control unit G2
3	03		bp306 – elevator control unit G3
4	04	sensor/positioning 1	bp306 – elevator control unit G4
5	05	sensor/positioning 2	bp306 – elevator control unit G5
6	06	door controls 1 (Tür A)	bp306 – elevator control unit G6
7	07	door controls 2 (Tür B)	bp306 – elevator control unit G7
8	08	door controls 3 (Tür C)	bp306 – elevator control unit G8
9	09	CDG-01 – gateway	CDG-01 – Gateway 1
10	0A		CDG-01 – Gateway 2
11	0B	I/O-Module (e. g. Wago I/O)	CDG-01 – Gateway 3
12	0C	CLK-01 - car terminal box	CDG-01 – Gateway 4
13	0D	load-measuring device	CDG-01 – Gateway 5
14	0E	emergency call unit	CDG-01 – Gateway 6
15	0F		CDG-01 – Gateway 7
16	10	cabin push-button unit node 1	CDG-01 – Gateway 8
17-20	11-14	cabin push-button unit nodes 2 - 5	
21-70	15-46	CAP-01 – landing call units landings 1 to 50 (e.g. line 1 resp. door A)	
71-120	47-78	CAP-01 – landing call units landings 1 to 50 (e.g. line 2 resp. door B)	
125	7D	CAP-01 default node-ID (pre-adjustment)	
126	7E	flashupdate bootloader	

BÖHNKE + PARTNER supply the elevator control unit with all node-IDs already preset.

7.10 Travelling Cable of the Car Terminal Box

The car terminal box is connected by a travelling cable type 16G0,75+8x(3xAWG22)+3x(2xAWG22) C 4.7x79.1 sw.

Please read the assignment of the wires from the circuit diagrams enclosed.

Wire	Terminal	Function
1	X92:4	socket of terminal box
2	X92:LN	neutral conductor of light
3	X94:48	photocell 230 V AC + voltage supply of door side A 230 V AC
4	X94:58	photocell 230 V AC + voltage supply of door side A 230 V AC
5	X94:NN(N)	neutral conductor controls + door sides A and B
6	X95:9	feed line to passive safety circuit of safety gear contact
7	X95:11	bridging of passive safety circuit of emergency control unit
8	X95:13	return line from emergency stop
9	X95:16	feed line to door contact
10	X95:17	return line from door contact side A
11	X95:18	return line from door contact side B
12		
13		
14		
15		
gr/ye	PE	electrical ground
violet	X96:1	emergency light in cabin (to be switched to negative)
green	X96:2	positive voltage of feed line to emergency light and alarm button
blue	X96:3	return line from alarm button
violet	X97:20A	voltage supply 24 V DC
green	X97:20A	voltage supply 24 V DC
orange	X97:100	voltage supply 0 V DC
violet	X97:100	voltage supply 0 V DC
green		
dark green		
violet		
green		
brown		
violet		
green		
grey		
violet		
green		
white		
violet		
green		
rot		
violet		
green		
black		
white	X96:10	Telephone a
blue	X96:11	Telephone b
shielding	electrical ground	shield terminal
white	X912:a	SLP 485 a
orange	X912:b	SLP 485 b
shielding	electrical ground	shield terminal
white		CAN_H
dark green		CAN_L
shielding	electrical ground	shield terminal

7.11 Selection of the Frequency Inverter

There are three possibilities to have the frequency inverter selected by bp306. Depending on the type of inverter, selection can be done by means of the CAN-bus or of the DCP-interface or by wiring in parallel with the controller/pre-control module RVM-01.

7.11.1 Selection by CAN-Bus

If your inverter has got a CANopen-interface according to the application profile CiA-417, you should interconnect it with bp306 via the CAN-bus. This way of selecting the inverter is the least complex one as regards installation and configuration due to the fact that the standardized application profile enables plug-and-play to a certain extent as well as excellent diagnostics.

Connect the inverter to the CAN1-connector of bp306 according to the circuit diagrams enclosed. Lay the cables and terminate the bus lines in compliance with the instructions of chapter 7.9.4.

7.11.2 DCP-Connection to the Inverter

The DCP-interface serves as a serial connecting means between elevator control unit and inverter. It is an RS485 point-to-point connection.

The DCP-interface is put on a 3-pole plug-connector on the left side of the BPC in bp306. The pin-assignment is given in the following table.

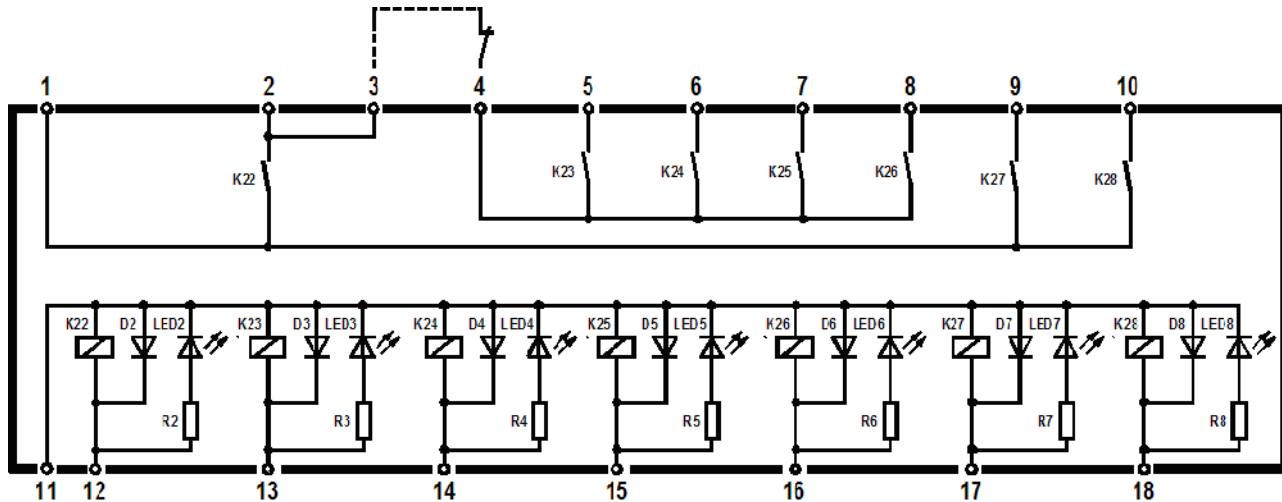
7.11.2.1 Pin-Assignment of the DCP-Plug Connector

Pin	Signal	Description
5	COM	electric ground of the signal (optional)
6	B	signal-line RS485 inverted
7	A	signal-line RS485

Connect the signal lines to the corresponding terminals of the inverter. As an option, you can connect the electric ground of the signal (please refer to the manual of the manufacturer of your inverter). The cable should be twisted and shielded. The shielding is to be installed at the side of the inverter only. See to a full-surface connection (refer to chapter 7.3). The maximum cable-length for the DCP-connection is 600 m.

7.11.3 Wiring in Parallel with RVM-01

The controller/pre-control module »RVM-01« selects every known inverter that does not dispose of a serial interface. The control signals for the different speeds and directions of travel are put out via 7 potential free relays equipped with gold-plated double-contacts to ascertain reliable switching in every possible demand on the inverter.



terminal assignment:

- 1 reference potential of VVVF-Control
- 3/4 bridge or, if required, limit switch to highspeed travel
- 2/5 -18 individual assignment, please adhere to the circuit diagrams

Examples: relay-functions with

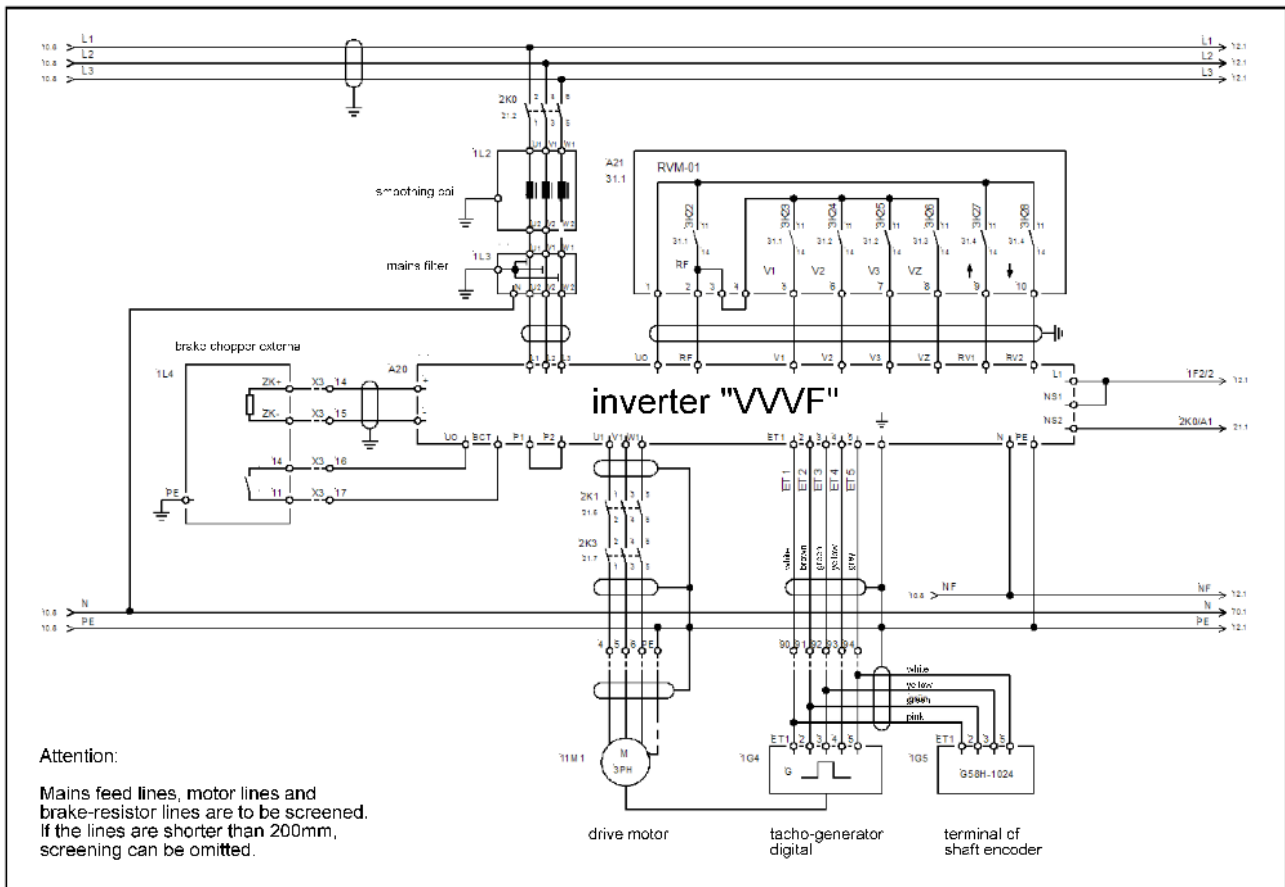
a) rope traction elevator,

b) hydraulically operated el with electronic valve LRV

- | | |
|-----------------------------|-------------------------|
| K22 v0 landing approach | K22 travel at highspeed |
| K23 v1 landing travel | K23 travel v/2 |
| K24 v2 maximum speed | K24 free |
| K25 vI inspection operation | K25 highspeed up |
| K26 vR emergency operation | K26 highspeed down |
| K27 vN relevelling | K27 lowspeed up |
| K28 free | K28 lowspeed down |

Picture 38

The circuitry of the RVM-01 module.



Picture 39

Selection of the inverter by RVM-01.

Control inputs (example)

GND reference potential

UO control voltage of the inverter
voltage output selecting the inputs

RF controller enabling, to be in selected status during a travel

V1 levelling speed

V2 intermediate speed

V3 travel speed

VZ relevelevelling speed

V1 direction default 1 UP

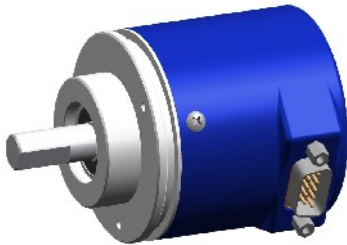
RV2 direction default 2 DOWN

Provided that the inverter has been connected according to the switching circuit suggested, the factory-preset motor will turn left, if input »RV1« is activated, and right, if »RV2« is activated (as seen from the motor side of the shaft.)

ZE1 additional speed V_ZE1

ZE2 additional speed V_ZE2

Preferably, these additional speeds are to be used for inspection and emergency operations.



▲ Picture 40

The absolute encoder AWG-05 CANopen (Type: GXP5W) does not terminate the CAN-Bus.



- ZE3** Additional speed V_ZE3
This input may activate different functions of the inverter, to be preset in the menu **INTERFACES**.
In the factory we set the additional speed V_ZE3.
- BCT** Brake chopper/temperature. As from this input you can monitor the temperature-switch or the malfunction-output of the brake chopper.

7.12 Installation of the Absolute Encoder

The absolute encoder is equipped with a 9-pin plug, the assignment of which conforms with the CANopen-standard. Our standard absolute encoder AWG-05 CANopen (type GXP5W.Z06) does not terminate the bus.

If the absolute encoder has been mounted on the car, its connecting cable can directly be plugged in the socket of the car terminal box CLK-01.

If the absolute encoder is installed in the well head, its connecting cable can be plugged in the respective socket in the control cabinet.

INFO!

Some types of position systems always terminate the CAN bus. In such a case the terminating resistor of the CLK-01-terminals has to be removed then. If your position system always terminates the bus you can find in the manual of this device or you can have a look on the website www.CANopen-Lift.org

7.13 Interconnection of the Group

By means of the interconnection of the group the elevator control units communicate with each other and transmit the well signals. The connection »CAN2« serves as an interface for the interconnection of the group.

The data lines are to be twisted. The lead from the terminals of the BPC to the terminal strip of the elevator control unit. Connection to the other members of the group is given by a plug-connector.

The lines of the well signals are connected to the group as described in the chapter »Topology«. If the well signals have been connected to the control units in a conventional way, they will have to be translated into CANopen-data by pc-boards type CAP-01 which are to be clipped onto the busbar.

7.14 Data Lines to the Remote Diagnostics System

Remote diagnostics can be realized via different mediums, subject to different rules each.

7.14.1 Analogue Telephone Line

If remote diagnostics are to be done via an analogue telephone extension it is by an analogue modem that data are transmitted. It may already have been foreseen on the BPC of bp306 (option MOD). In that case, connection is to be done as from the RJ11-socket of the BPC to the telephone outlet. If your bp306 is not equipped with this option, an external modem with serial interface can be used, provided that it conforms to the V.250-standard.

If more than one control unit is allocated to a common telephone outlet or if there is an emergency call system that uses this analogue telephone outlet as well, you will have to use an emergency call manager (refer to chapter Connection Of The Emergency Call System).

7.14.2 ISDN

If there is an ISDN-outlet available for the data remote diagnostics, the integrated ISDN-module (Option ISDN) will be used or an external ISDN-Interface.

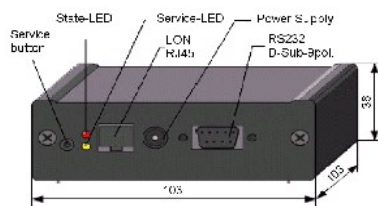
7.14.3 Ethernet

If data remote diagnostics is to be done via an Intranet or the Internet, usually an Ethernet-interface will be available in the machine-room. In this case the integrated Ethernet-module (option ETH) is to be used or an external comserver at the communications port of bp306.



▲ **Picture 41**

External comserver connecting bp306 to the Ethernet.



Picture 42

LON-Interface ASBuP connecting bp306 to LONworks-Network

7.14.4 LON

Connection to a LONworks-network – e. g. within the building automation system – is done by the ASBuP-interface. It is connected to the communication port of bp306 on one hand and by a RJ45-plug to the LON-network on the other hand.

7.14.5 Installation of the Emergency Call System

Emergency call systems mostly require analogue telephone extensions. If there is an analogue extension available especially for the emergency call system, wiring can be done as specified for the emergency call system. Very often, however, the emergency call system and the modem of the control unit have to share in one telephone extension. Then it is to be ascertained that the emergency call system is treated with preference. Some emergency call systems place a through-connected extension at the disposal of a data remote diagnostics system as long as no emergency call is at hand. If there is no such extension available with the emergency call system, a so-called emergency call manager will have to be applied that interrupts an existing connection to the data remote diagnostics system in case of emergency and renders the freed telephone extension available to the emergency call system.

There is no generally valid scheme of how to install an emergency call system. Please read the circuit diagrams and documentation concerning the emergency call system, which you will find enclosed to the device.

8 Commissioning Instructions

ATTENTION!

The control systems make BÖHNKE + PARTNER and the drive system must not be commissioned before having fulfilled the following conditions:

- The control unit has been mounted and installed according to this manual.
- Operation and setting possibilities are all known (see user manual bp306).
- The valid EMC-rules (electro-magnetic compatibility) are complied with!
- Power circuit, control circuit and safety circuit have been executed and checked according to this manual (see checklist, chapter Fehler: Referenz nicht gefunden).
- Instructions that have to be followed when commissioning the plant have been noted:
 - First Travel with Emergency Controls (chapter 8.7),
 - First Travel with Inspection Controls (chapter 8.8),
 - First Travel with Normal Operation Controls (chapter 8.12) and
 - Commissioning of the Well Selection System (chapter 8.11).



INFO!

Special executions are subject to reading the supplementary instructions prior to commissioning.

After commissioning the actual parameters are to be documented in the printout of the basic and service menu. Malfunctions stored during commissioning (batch memory/malfunction list) can be deleted in the submenu »diagnosis«. If third persons have access (e.g. janitor), protect the menus against unauthorized access by allocating a basic and a service code number (4 digits).



CAUTION!

Prior to each travel the operator has to ascertain that neither persons nor material are endangered.



At the acceptance test comply with the »Technical Tips« (chapter 8.3).

8.1 Preparation

There is no need of special measuring instruments for commissioning except a multimeter. It is recommended to use a voltage-test module STM-02.

8.2 Voltage-Test Module STM-02

To protect your elevator control unit against damaging excess voltage while installing or repairing it, use the voltage-test module STM-02 especially designed for this purpose.



Picture 43

Voltage-test module STM-02. It protects the control unit against overvoltage.

INFO!

For monitoring purposes, integrate the voltage-test module in the control unit for the time of commissioning. As soon as commissioning will be finished, remove it. You can use it for further commissioning operations.

8.2.1 Prior to the First Switch-On

According to VDE 0100 (standard from VDE (association of German engineers)) and TRA (German Safety Regulations For Elevators), the control circuit is to be earthed. For that reason, the »PE«-terminal of the elevator control unit is connected to terminal bp100 of bp306 by a green/yellow conductor.



ATTENTION!

Make sure that the elevator is without voltage!

- Disconnect the green/yellow protective earth conductor from terminal 100 of bp306. The negative potential of the control circuit now must not have any contact with the PE-potential of the control unit at no spot whatsoever in the elevator plant.
- For that reason unconditionally ascertain before connecting the STM-02 device, that there really is no connection between the PE-terminal of the elevator control unit and terminal 100 of bp 306. Use an Ohm-meter or a circuit continuity tester.
- After having done these checks you can connect the voltage-testing module STM-02 as shown in the diagram enclosed. Connect conductor 1 to terminal 100 in bp306 and conductor 2 to terminal 20A of the terminal-strip in the control unit.

After that you can start your installation or repair work.

8.2.2 Functional Description of Voltage-Test Module STM-02

As soon as STM-02 will have been installed properly, the control circuit 24 V DC will be off-ground. The elevator plant can be switched on and a possible overvoltage within the control circuit towards »PE« cannot result in a fault-current. The risk of damages within the bp306-system is banned.

CAUTION!

- STM-02 will signalize overvoltages in the control circuit by a LED and a buzzer. At that moment you are running a risk in the area of the control voltage.
- If STM-02 signalizes a fault, switch the elevator off at once, find the fault and eliminate it.



The fault message is memorized by a bistable relay and will remain existing even if the control voltage is switched off and on again. To reset the unit to its original mode press the reset button on the casing of STM-02 after having eliminated the fault.

CAUTION!

- Immediately after commissioning connect the green/yellow PE-line to terminal 100 within bp306 again!
- Remove STM-02 from the control unit.



8.3 Technical Tips Concerning the Control Unit

5. Perfect and safe operation of the control unit are subject to appropriate transport, storage, mounting and installation as well as appropriate use and maintenance of the appliances.
6. The control unit has been designed, manufactured and tested in compliance with DIN EN 81 and the relevant VDE-rules. You will have to adhere to the relevant regulations for the commissioning of electric control appliances and equipment. Operation of the devices is also subject to the compliance with the local lightning protection rules. Every control unit has got a serial number and is accompanied by unambiguously identified circuit diagrams and technical documentation.
7. The control system bp306 serves for the limited purpose of processing data provided from elevator control units. All the control signals are processed by positive circuitry. The safety rules DIN EN 81 are not infringed by electronic data processing.

8. The control system bp306 was examined by the authorities in charge and has been awarded an EC type-examination certificate. In chapter 3.1 you can see this EC type-examination certificate and in chapter 3.3 the certificate of conformity according to the EC-directives (95/16/EC) stating that the component applied conforms to the regulations.
9. The components of the control system comply with the German safety regulations DIN EN 81 and VDE 0100 / 0101 / 0551 / 0660 as well as BGV A2. Control cabinets are executed according to VDE 0660 part 500.
10. The mains and auxiliary contactors used in the control systems conform to the German safety regulations DIN EN 81, part 1, 13.2 (TRA 260.82) and VDE 0660 at least device class D3.
11. Voltage fluctuations are acceptable, if they keep within the tolerance area of the utility companies (+10%, -20%).
12. Malfunctions caused by inadmissible voltage rise will not be subject to the liability of the manufacturer.
13. Particularities related to the use of an uninterruptible power supply unit (USV) are to be observed. First read the according operation manual and only then commission the wired USV as it will have to ascertain the power supply to every necessary control function. Regularly check the uninterruptible power supply unit with regard to proper functions and failure-free operation. Adhere to the instructions of the manufacturer of the uninterruptible power supply unit.
14. Isolation and short-circuit measuring:
 - 1) Since 01.01.1996 every control unit has been equipped with an attenuation filter that might, however, be damaged while measuring the isolation. Therefore, before doing so, switch off fuse 1F2.
 - 2) An uninterruptible power supply unit possibly integrated in the control unit has completely to be disconnected and the contacts accordingly bridged in the control unit before measuring isolation and short-circuit.
 - 3) Adhere to the safety instructions applicable to isolation measuring as you will have to apprehend danger to you and to the equipment.
15. Every relay and contactor integrated in the control system must be radio-shielded. (refer to chapter 7.2).

16. Motor protection switch, overcurrent release, current-operated circuit breaker etc. have been factory-set and will have to be individually adapted to the appliances connected by you while commissioning the control system.
17. According to the respective operation instructions, the following wiring instructions are to be followed:
 - Conductor N (N) to terminal 9 of bp306.
 - Conductor N (F) to terminal 14 of bp306.
18. According to VDE-rules and TRA 200, the signal voltage (minus 24 V DC) is to be connected to the protective earth conductor (PE) of the mains supply.
 - Terminal 100 (minus 24 V DC) of bp306 is to be connected to the PE-terminal in the control unit, thus creating a floating network and making it possible to recognize an earth leakage of the signal voltage (+24 V DC) at once.
 - Transformers are connected to the earth at the secondary side (e.g. special voltage of brake or valve) thus creating a floating network and making it possible to recognize an earth leakage of the special voltage at once.
19. Terminals 20A and 20C (+24 V DC max. 2,5 A resp. 5 A) of bp306 are monitored with regard to overload and short-circuit. Overload will be signalized by the LCD.
20. Safety circuit and query-unit of bp306 will be fused by max. 1 A.
21. Pay attention to the control pulse-diagram. Presentation of the pulse-lugs is not true to scale. It is just a schematical diagram.
22. Arrangement of the shutdown points in the landing area (landing level zone) is to be observed precisely.
23. Signals from pulse-generator and flush-level switches can be monitored on the LC-display in the service-menu, sub-menu well signals, not only in the travel mode but also in the inspection control mode or emergency control mode.
24. It is possible to keep the car door closed at the landings during maintenance and service activities. See service-menu, sub-menu maintenance, on the LC-display.
25. For investigating activities, the car can be driven to the topmost or to the bottom landing by activating the switch »Call«:
 - switch up: car travels to topmost landing,
 - switch down: car travels to bottom landing.
26. In the inspection control mode, terminals 101 and 102 of bp306 resp. CLK-01 become voltageless (see DIN EN 81, 14.2.1.3):
 - all car and landing calls are deleted and blocked,
 - doors cannot be opened, automatic door movement is disabled,
 - high travel-speed is automatically reduced at the correction switch

- the travel is stopped at the flush-level switch of the terminal landing,
 - the relevelling device is switched off,
 - the homing function of hydraulically operated elevators is set ineffective.
27. In the emergency control mode, terminal 102 of bp306 becomes voltagefree (refer to DIN EN 81, 14.2.1.4):
- all car and landing calls are deleted and blocked,
 - doors cannot be opened, automatic door movement is disabled,
 - travel at high speed is automatically slowed down at the correction switch.
 - the flush-level switch of the terminal landing can be overtraveled in the emergency control mode!
 - see service menu, sub-menu "maintenance" on the LCD.
 - the relevelling device is disabled,
 - the returning function of hydraulically operated elevators is set ineffective.
28. If the operation-modes emergency control and inspection control are switched on simultaneously, the car cannot be moved anymore.
29. Switching the landing controls off by switch S85 will delete all car and landing calls, landing calls will be blocked, but car commands will still be accepted.
30. If landing controls are switched off, also the parking landing will be ineffective.
31. Light voltage is monitored by the control unit. If it fails, the car - if travelling - will be stopped and remain at the landing with open door. Further travels are banned
If it is a hydraulically operated elevator, it will sink down to the home landing.
Inspection and emergency control remain operating, as well as the relevelling device (see DIN EN 81, 8.17.3)
32. Motor protection by PTC-monitoring is realized by positive temperature thermistors wrapped up in the coil of the A.C. motor. The monitoring circuitry integrated in bp306 monitors the operating temperature of the motor.

33. Die PTC-threshold values are monitored and processed by a follow-up circuitry.
- a) Temperature normal value < 2,2 kOhm = normal operation,
 - b) Temperature too high value > 2,7 kOhm = PTC-thermistor has responded, refer to fault messages.
34. Basic Menu And Setting Possibilities:
- Rope-traction elevator
 - immediate stop without switch-off
 - stop at next flush-level switch ahead without switch-off
 - immediate stop and switch-off
 - stop at next flush-level switch ahead and switch-off
 - Hydraulically operated elevator
 - stop and return without switch-off
 - stop without return and switch-off
 - stop and return and switch-off
 - stop and switch-off without return
35. The fault-message concerning excess-temperature of the motor is written in the batch memory and the malfunction list. If the data remote monitoring system is connected, it will immediately report this malfunction to the service centre.
36. The homing function of hydraulically operated elevators to the bottom landing during normal operation, i. e.: all safety functions, will have to be regarded as OK,
- a) if it is automatically initiated after the preset period (max. 15 min.).
 - b) if it is automatically initiated as soon as the control unit is switched off. (e. g. remote switch-off).
 - c) if it is automatically initiated after the preset period (max. 15 min) meant to elapse after switch-off of the landing controls.
 - In all three cases [a), b), c)] the creeping correction system will remain operating (see DIN EN 81 part 2, 14.2.1.5).
 - When the car arrives at the bottom landing, the door will open in all three [a), b), c)] cases. The button »open the door« will remain active all the time.
 - The cabin light can be extinguished in idle condition and if the door is closed; this function is adjustable to 1, 10 or 30 minutes. The cabin light is switched on again as soon as the elevator resumes operation.
37. Activation of the top emergency limit switch of a hydraulically operated elevator will shut down the elevator at once. If the car comes free again by subsequent creeping, the normal functions will remain off and returning to the bottom landing will immediately be executed, if the safety circuit is closed. The car door is opened and closed again and the car parks at the bottom landing

and does not accept any call. The »door open«-button, however, remains active all the time.

38. The creeping correction system remains operating furtheron (see DIN EN 81, part 2, 14.2.1.5)
39. At hydraulically operated elevators, the creeping correction system is activated as soon as the runtime monitoring is activated (terminal 42 = 1) and the elevator is immediately shut down.
40. At hydraulically operated elevators, the anti-creep watchdog is queried as follows:
 - a) the up-creeping watchdog will automatically cause the car to be returned to the bottom landing and shut down there. If the runtime monitoring responds outside the landing area zone during this action, the elevator will be blocked at once, the creeping correction system will not be activated, as the first malfunction registered was »up-creeping watchdog«.
 - b) the down-creeping watchdog will cause the elevator to be shut down at once. The creeping correction system will furtheron remain operating.
41. The creeping correction system will remain operating, if a hydraulically operated elevator is overloaded.
42. Query of the overload-input is done at standstill only (terminal 88).
43. The excess-pressure switch of a hydraulically operated elevator is connected to terminal 35 and queried at this terminal as well. The basic menu offers - depending on the function - to choose or leave out shutdown in case of excess pressure. In the circuit diagrams you are pointed to this possibility as well.
44. A hydraulically operated elevator can principally be equipped with a emergency circuitry down (similar to emergency circuitry »up only«). If an emergency circuitry down is installed, the following switches may be bridged: shortfall in pressure, pipe rupture, emergency bottom limit switch and safety gear contact.



CAUTION!

A combined safety gear contact / slack-rope switch must not be bridged, nor any other switch.

Regarding the emergency circuitry »down« the following counts:

- a) the bottom emergency limit switch must not bridged!
- b) an emergency circuitry »down« must not be applied in elevators with 2:1-suspension without slack-rope switch!

ATTENTION!

Operating instructions and labels at the emergency circuitry unit must inform about the risks!

Example: A defective hydraulic hose or a defective threaded hose coupling will cause the hydraulic oil to be pumped into the well pit!

45. The hydraulically operated elevator must conform to all items stipulated by the relevant local "water protection regulations"!

Runtime monitoring is a standard function in every elevator control unit. To check this function, proceed as follows (DIN EN 81, part 1, 12.10 and part 2, 12.12):

Well Selection By Magnet Switches:

- a) Make the car stop at the bottom landing,
- b) disconnect pulse transmitter from S75 resp. S77,
- c) enter travel command to topmost landing,
- d) car will pass by the pulse transmitters without receiving the necessary signals,
- e) after the preset time interval (max. 45 s), the electronic monitoring device of the elevator control unit will automatically interrupt the travel,
- f) after that the elevator control remains blocked for further travels (see information on LCD),
- g) connect pulse transmitter again to S75 resp. S77,
- h) switch elevator control unit off and on again to repeal the blocking,
- i) the control unit is now in operating condition again.

Well Selection By Absolute Encoder

- a) Make the car stop at the bottom landing,
- b) reduce the set runtime of the runtime monitoring in the control system (LC-display) so that it does not correspond to the travel speed anymore,
- c) enter travel command to the topmost landing,
- d) the car will not reach the next encoding point within the runtime period,
- e) after the preset time, the electronic monitoring function of the elevator control will automatically interrupt the travel,
- f) after that the elevator control remains blocked for further travels (see information on LCD),
- g) set the runtime of the runtime monitoring in the control system (LC-display) to a value corresponding to the travel speed,
- h) switch elevator control unit off and on again to repeal the blocking,
- i) the control unit is now in operating condition again.

46. The creeping-correction system of a hydraulically operated elevator will remain operating, even if the runtime monitoring has responded.



ATTENTION!

It will damage the motor, if due to a phase-failure (e.g. contact-problems of the travel contactors) the creeping correction system (relevelling) remains operating although the runtime monitoring has responded.



INFO!

1) We have preset the parameterizable program runs, time intervals, etc. of the control systems by means of the basic menu and the service menu according to the technical specification. Anyhow, while commissioning the elevator controls you must set the parameters according to the appliances installed and conforming to the local requirements.

2) The duty to exercise care in the proper parameter-setting behoves to the company installing the equipment. Pay attention to the local regulations stipulated by the fire-fighting experts for fire-brigade elevators and fire-emergency elevators.

3) The basic menu as well as the service menu can be blocked by a 4-digit code each. The codes shall protect the parameters from unwitting resetting, they must be preserved with utmost care. Disclose the codes to authorized persons only.

47. To safeguard the individual parameters of the elevator, call in the basic menu the parameter memorize factory-setting.
48. Conclude the setting by pressing the END-button after having entered the changes in the function-menu of the LCD, then return to the basic display of the LCD.

8.4 Checks to be Done Before Starting the Control

Unit



CAUTION!

- Work this checklist off after having installed a new control unit or refurbished an existing one.
- Take the next item only, if you have answered the current one with »Yes«.

Weight balancing between car and counterweight has taken place. Yes ☐

The mechanical brake has been adjusted. Yes ☐

The car is positioned in a sufficient distance from the limit switches (minimum 1 m). Yes ☐

- Mains voltage of 3 x 400 V AC is available. Yes ☐
- Buffers have been mounted and are functioning. Yes ☐
- Speed governor and safety gear have been mounted and are functioning. Yes ☐
- Safety-circuit contacts of well and car have been mounted and installed. Yes ☐
- Have you paid attention to the safety instructions in chapter 2 and followed them? Yes ☐
- The control unit make Firma BÖHNKE + PARTNER is accompanied by: Yes ☐
- Circuit diagrams, unambiguously identified by the serial number of the control unit (e. g.: 93401)
 - parts list,
 - EC Type Examination Certificate and Certificate of Conformity with System bp306,
 - terminal plans,
 - basic setting,
 - port assignment plans and general tips concerning the control system bp306.
- Have these documents found to be at hand completely?
- Have you followed the circuit diagrams that belong to the control unit? Yes ☐
- Have you paid attention to the radio-shielding instructions in chapter 7.2 and followed them? Yes ☐
- Have you checked proper and tight connection of every terminal point? Yes ☐
- Have you switched off the mains switch? Yes ☐
- Have you connected the voltage-test module STM-02 (see chapter 8.2)? Yes ☐
- Check the voltage supply! Have L1, L2, L3, N and PE been properly connected (clockwise rotating field)? Yes ☐
- Does the cross-section of the conductors correspond to the power-draw of the elevator plant? Yes ☐
- If there is a load switch, check whether the admissible fusible elements are installed as well? Yes ☐
- Is the automatic circuit breaker 1F2 for the control voltage off? Yes ☐
- Is the automatic circuit breaker 1F4 for the safety circuit off? Yes ☐
- Have the feedlines been correctly fused? Yes ☐
- If there is a quick activation circuitry available for the brake, have the protection switches been switched on? Yes ☐
- Motor protection switch, overcurrent activator, FI protection switch, phase watchdog etc. can be pre-installed by BÖHNKE + PARTNER only, but while commissioning the plant you will have to set them to the values suiting the appliances connected
- Have you completed these adaptations? Yes ☐
- Have all the PE-conductors been connected properly? Yes ☐
- Have you done everything to conform to the EMC-instructions of the manufacturer of the frequency inverter? Yes ☐
- Have you followed the commissioning instructions concerning speed and drive controls? Yes ☐

Has the emergency control unit been switched on? Yes ☐
If you have answered all these questions with »yes«, you may switch in the mains voltage according to the following chapter.

8.5 Switching the Mains Voltage in

If you have answered all the questions of the »Checks To Be Done Before Starting The Control Unit« with »Yes«, you can switch the mains voltage in. After that check the items of the following checklist.

- Is the mains switch on? Yes ☐
- Is the emergency control unit on? Yes ☐
- Is the automatic circuit breaker 1F2 for the control voltage on? Yes ☐
- Is the automatic circuit breaker 1F4 for the safety circuit on? Yes ☐
- Have all the safety components remained inactive? Yes ☐
- Is it that the voltage-test module STM-02 is calm and does not send any acoustic or optic warning signals? Yes ☐
- Is it that the LCD does not signalize any problem with the voltage in the bp306 system? Yes ☐
- Is the voltage in the power supply unit of bp306 between terminals L and N = 230 V AC? Yes ☐
- Is the voltage at the terminal strip X4 between terminals 1 (LS) and N = 230 V AC? Yes ☐
- Is the voltage at terminal strip X8 from terminal 20 (A or C) towards terminal 100 = 24 V DC? Yes ☐
- Is it that the LCD-illumination does not flash? (Would mean that plant was shut down!) Yes ☐
- Does the colon of the LCD-clock of bp306 flash? Yes ☐
- Is the cabin light voltage at terminal strip X2 between terminal 1 and LN = 230 V AC? Yes ☐
- Are the two LEDs for 5 V and 24 V of the power supply unit of bp306 bright? Yes ☐
- Do you read the RHS-symbol on the display of bp306 (emergency control active)? Yes ☐

If you have answered all these question with »Yes«, you can proceed with checking the parameters of the control unit and the drive unit.

8.6 Checking the Parameters of Control Unit and Drive Unit

After having properly switched in the mains voltage and made sure that there is obviously no fault to be traced, check the parameters set for the control unit and the drive unit.

Execute the drive-unit check according to the relevant commissioning documentation.

The documentation of the control unit is accompanied by a hard-copy of all factory-set parameters by BÖHNKE + PARTNER. Check whether they correspond to the particularities on site. If necessary, adapt the parameters by means of the display of bp306 (refer to user manual bp306).

8.6.1 Checking the Bus-Lines

A first impression of the functions of the CAN-bus can be read from the diagnosis-LEDs located at the left side of the display of the BPC.

For each bus connected there is a LED shining in red on the printed-circuit board, CP1 for CAN1 and CP2 for CAN2. The LEDs each demonstrate the actual operational mode of the according bus. From the following table you can read the status of the LED and its meaning. While the system is being started, both luminous diodes shine for a short moment. After that both of them are out.

Status	Meaning
off	CAN-Bus: faultless
1 pulse	CAN-Bus: warning
2 pulse	CAN-Bus: malfunction
on	CAN-Bus: Bus-Off (out of oper., after appr. 10 s auto-reset)
flashing	Node-ID fault: duplicate node-ID in the network

Table 1: Meanings of the CAN-Diagnosis-LEDs of BPC.

8.6.2 Checking the Bus Termination

As mentioned in chapter 7.9 the bus must be terminated at both ends. Check both car-bus and group-bus to make sure that they have properly terminated ends.

**INFO!**

Some types of position systems always terminates the can bus. In such a case the terminating resistor of the CLK-01-terminals has to be removed then. If your position system always terminates the bus you can find in the manual of this device or you can have a look on the website www.CANopen-Lift.org

8.6.3 Checking the CAN-Parameters

To check the CAN-Parameters of the control unit call in the basic information or the basic menu of the control units. In **PORTS → SER. PORTS → PORTS CAN → CAN DEVICES** you will find a list of all CAN-devices possibly used. Check, whether the devices to be applied in your system have been activated and are all right.

All CAN-devices we supply to you have been pre-configured, you need not set further parameters at this point. If you compose a control system from OEM-components, you will need CAN-adapters for the CAN-devices and »CANwizard« for the PC and the software. Learn more about Canwizard and the configuration of devices in the CANwizard-manual resp. on the website www.CANwizard.de.

If all devices have given a proper feedback, you can start the first travel with emergency controls.

8.6.4 Checking the DCP-Connection

If the inverter is selected via a DCP-interface, the following items are to be checked:

- ▶ Has wiring been done in compliance with the circuit diagrams,
- ▶ Has bp306 been set to the correct inverter type,
- ▶ Has the DCP-interface been activated in bp306 and in the inverter,
- ▶ Have both units been set to the same protocole (DCP-01 – DCP-04),
- ▶ Is it that there is no malfuntion at present?

8.7 First Travel with Emergency Controls

The emergency control is used for making the elevator travel during installation and maintenance work.

CAUTION!

Pay attention to the security instructions in chapter 2.

For your personal safety it is important that the switches of emergency control, inspection control and emergency stop as well as buttons up and down have been wired in the safety circuit as stipulated in the wiring diagrams.

Emergency stop, door and locking contacts must not be bridged!

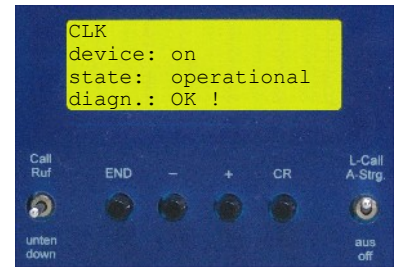
This will ascertain that interruption of a contact, either emergency or door or lock, immediately stops the elevator down.

If the emergency control switch is on, the terminals X5.15 and X12.102 must be dead and terminal X7.101 live.

Correction switches S71 and S72 must sit at the right deceleration point at the terminal landing and switch reliably.

If either switch up or switch down of the emergency control is activated, the contacts of the safety circuit must either be closed or bridged by the switch of the elevator control.

Travel commands are controlled and monitored by the control system bp306.



▲ Picture 44

Example: CLK has given proper feedback.



▲ Picture 45

Example of an USB-to-CAN-adapter make Ixxat used to configure CAN-components.



If a photocell is integrated, terminal X7.53 (door B: X7.56) must be live.

The command-key (emergency control switch) is located in the door of the control cabinet in the machine room (see DIN EN 81, part 1, 14.2.1.4).



INFO!

If the inspection control unit is switched on, it will override the emergency control unit (see DIN EN 81, part 1, 14.2.1.3 and 14.2.1.4).

At control units make BÖHNKE + PARTNER GmbH the preference of the inspection control is given also in cases when the car or door cannot be driven anymore, regardless of whether the inspection control is on and the emergency control supplementarily cut in or and vice versa.

The emergency control functions are essentially the same as those of the inspection control, but emergency control bridges the following safety devices:

- ▶ speed governor,
- ▶ buffer contacts,
- ▶ emergency limit switches,
- ▶ safety gear contact and
- ▶ minimum-pressure switch of hydraulically operated elevators.

The car can be driven out from the limit switches, if the inspection control is switched off and the emergency control switched on. To be set in the maintenance menu **DRIVE OUT FROM THE FLUSH-LEVEL SWITCH OF THE TOPMOST LANDING (SKIDDING TEST, TÜV)**.

Switching the emergency control on makes all existing calls to be cancelled and the push-button units and superior control functions disabled.

If the control unit is not equipped with an absolute encoder, a correction travel will be required as soon as you have returned to normal operation again. For that purpose enter a landing call or car command.

8.8 First Travel with Inspection Controls

The inspection control is required for making the car travel during installation and maintenance work.



CAUTION!

Pay attention to the security instructions in chapter 2.

For your personal security it is important that the switches of emergency control and inspection control and emergency stop as well as buttons up and down have been wired in the safety circuit as prescribed by the wiring diagrams.

This will ascertain that interruption of a contact, either emergency or door or lock, immediately stops the elevator down.

If the inspection control switch is on, the terminals X5.15, X7.101 and X12.102 must be dead.

Correction switches S71 and S72 must sit at the right deceleration point at the terminal landing and switch reliably.

If either switch up or switch down of the inspection control is activated, the contacts of the safety circuit must be closed.

Travel commands are controlled and monitored by the control system bp306. All disposals of the safety circuit remain effective. If either contact of the safety circuit is interrupted, the elevator will be shut down immediately. If a photocell is integrated, terminal X7.53 (door B: X7.56) must be live.

The inspection control is situated on the roof of the car. Switching the inspection control on will disable automatic door functions and simultaneously automatic elevator operation as well. Driving the car and the door will be possible only by activating the command buttons of the inspection control unit (dead man's circuit) in absence of the emergency control functions (either switched off or not existing). In addition, activation of a stop-button can cause an emergency stop. You can make the emergency-stop-button return in its original position by its turn-to-reset feature only. The limit switches hinder the car from overtravelling the terminal landings.

INFO!

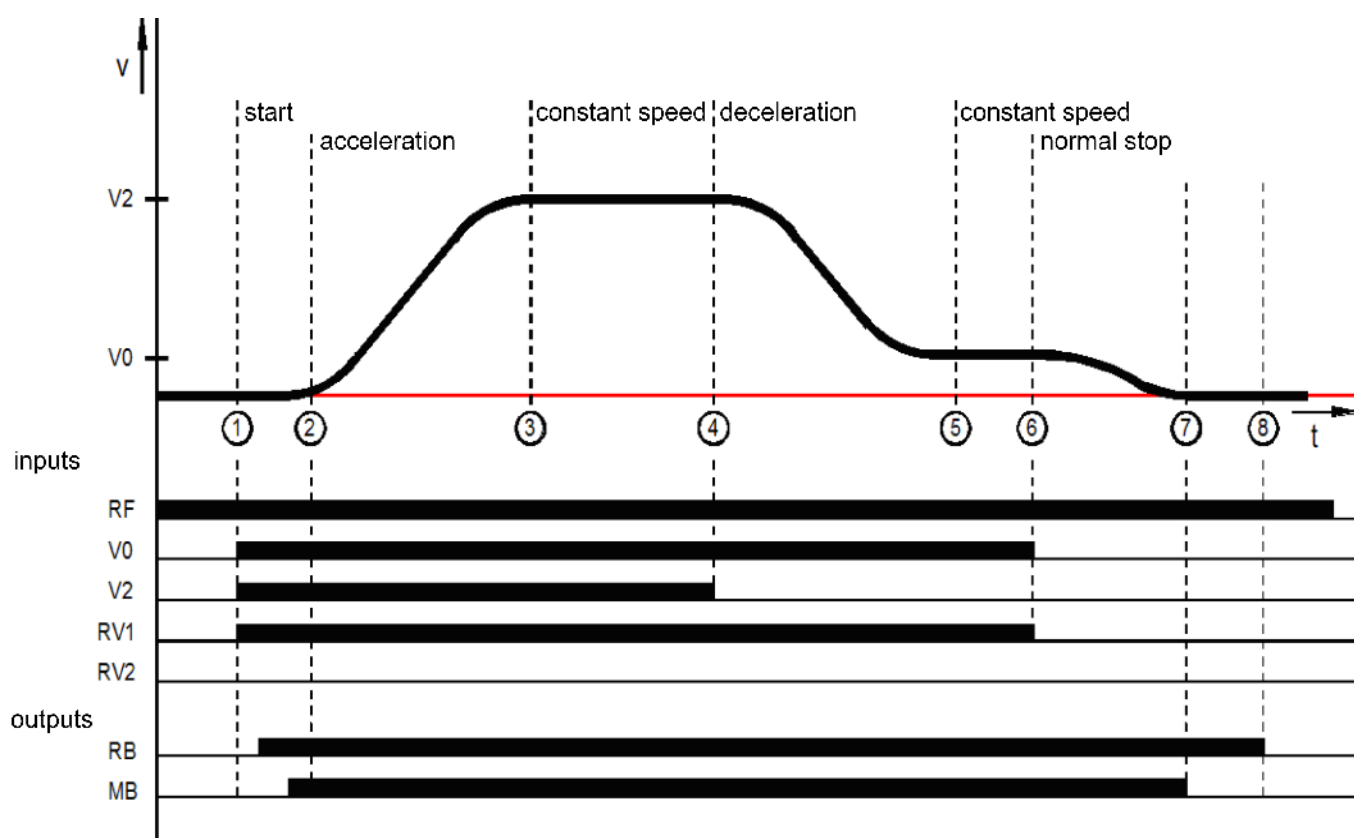
As soon as it is switched on the inspection control will override the emergency control (see DIN EN 81, part 1, 14.2.1.3 and 14.2.1.4). At control units make BÖHNKE + PARTNER GmbH the preference of the inspection control is given also in cases when the car or door cannot be driven anymore, regardless of whether the inspection control is on and the emergency control supplementarily cut in or and vice versa.

Switching the emergency control on makes all existing calls to be cancelled and the car and landing push-button units and superior control functions disabled.

All arrangements of the safety circuit remain effective (DIN EN 81, part 1, 14.2.1.3 and TRA 266.1).

After having returned to normal operation, enter a call to initiate a correction travel. Control units equipped with an absolute encoder do not require a correction travel.





Picture 46

Inverter controls the speeds of a normal travel by RVM-01.

8.9 Course of a regulated Two-Speed Travel

(Summary)

After having switched on the main contactors and released the inverter, the control selects the inverter by setting the direction of travel, speed V3 and the starting signal. The inverter keeps the motor idle with $n=0$ revolutions per minute and sends signal MB to the control unit (1 to 2) via terminal 31, which means that the electromagnetic brake shall be opened. After having switched the brake by relay K4 of the control unit, the motor accelerates until speed V3 is reached (2 to 3). A travel at constant speed follows (3 to 4) holding on until speed V3=0 is cancelled. The motor slows down to positioning speed V1 (4 to 5). After a short distance, selection of speed V1=0 is abolished (5 to 6), the motor decelerates further (6 to 7). As soon as the motor stands still, the inverter will close the electro-magnetic brake MB (7 to 8). The main contactors are switched off by signal RF with time-delay.

INFO!

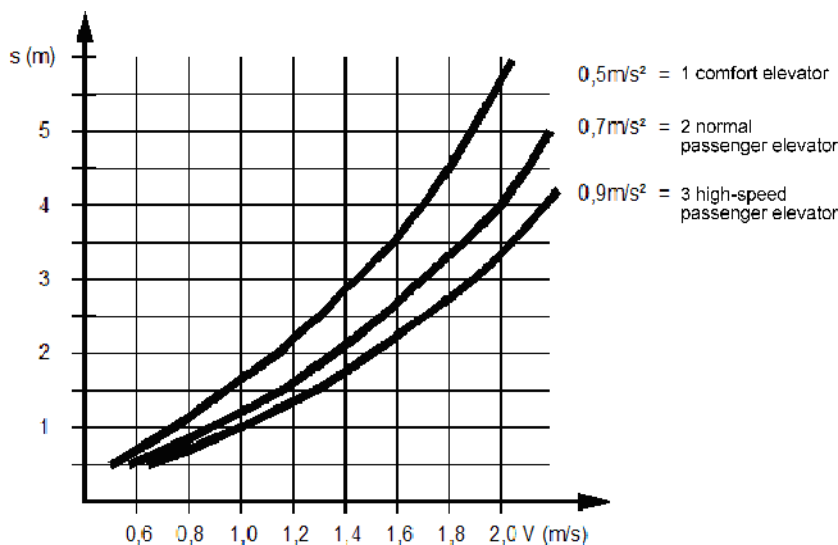
- The electromagnetic blocking brake is to be switched on and off without time-delay by relay MB, in order that the inverter can initiate jerkless starts and stops.
- The main contactors to the motor are to be switched on and off without time-delay by relay RB to enable jerkless starts and stops.
- If the collective malfunction-relay of the inverter falls off due to a malfunction, it is to be ascertained by the control that mechanical brake and main contactor to the motor are switched off immediately. The output of the collective malfunction-relay of the inverter is connected to terminal 34 of the control unit.
- Together with the mains contactor of the inverter the mains contactor of the control unit has to be opened or closed without time-delay.. This is the only way to monitor the brake-chopper with regard to excess temperature and disconnect the inverter from mains, if necessary.



8.9.1 Disconnection Points for the High Travelling Speed (V3)

The braking distance can be seen from the diagram. The values shown are only valid, if the factory-set roundings $R\_NEG1=60\%$ and $R\_NEG2=90\%$ are kept unchanged. Moreover, it is supposed that the control unit will give the disconnection points to the inverter without delay.

The values shown are to be regarded as typical values only and should be adapted to your individual sensation at site.



V	brake dist. 1	brake dist. 2	brake dist. 3
0,8	1,18	0,90	0,70
1,2	2,25	1,73	1,41
1,6	3,60	2,70	2,36
2,0	5,40	4,10	3,40

▲ Picture 47

Diagram and table of braking distance



RECOMMENDATION

The disconnection point should - if possible - be set to a value higher than the determined braking distance, in order to gain freedom for the optimisation of the speed curve behaviour.

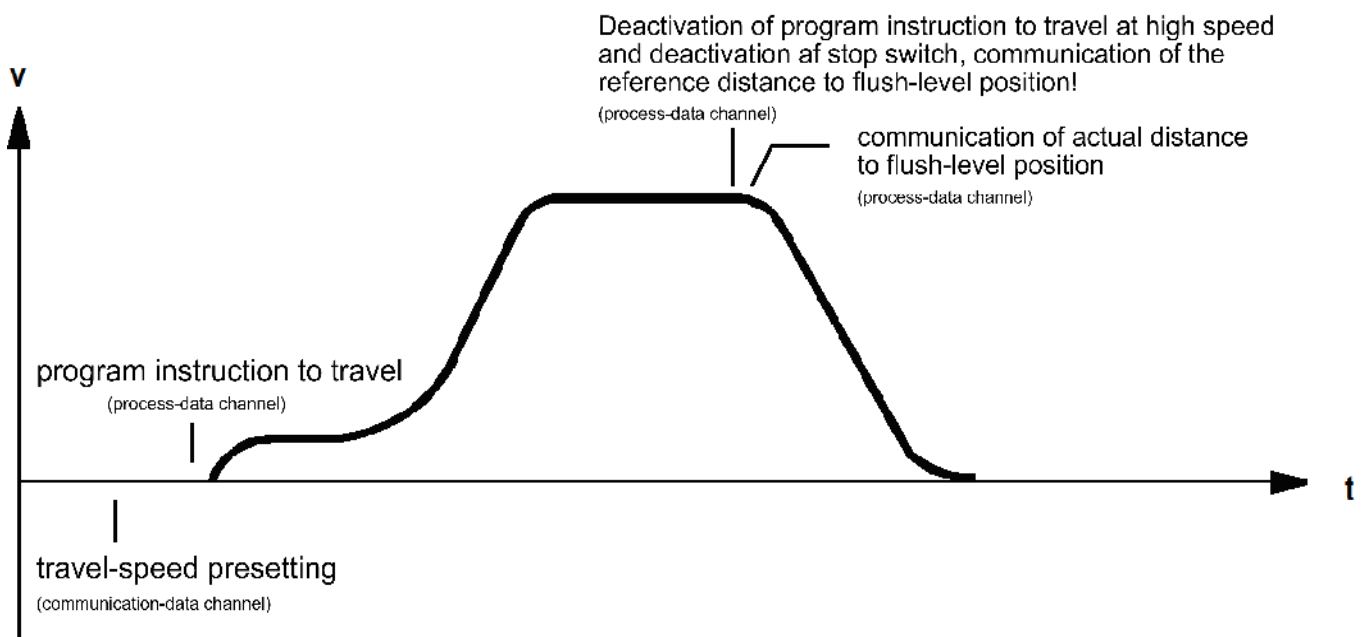
To most possibly achieve equal and short distances travelled at speed V_0 , the disconnection points are to be set with a precision of ± 1 cm.

The disconnection points for speed V_2 are to be set with a precision of ± 1 mm depending on the setting of V_0 before reaching the flush landing level.

8.10 Course of a Direct Travel with DCP (Summary)

With protocols DCP-01/03 the control unit and the inverter serially exchange signals only, which would go via terminals in case of selection. The speed curve corresponds to a normal travel as described in the previous chapter.

At the protocols DCP-02/04 the control unit cyclically transmits, besides some control signals, the remaining distance to the next landing to the inverter, thus enabling the inverter to compute an ideal speed curve and make the car directly approach the landing.



Picture 48

Speed curve of a travel with direct landing approach.

8.11 Commissioning of the Well Selection System

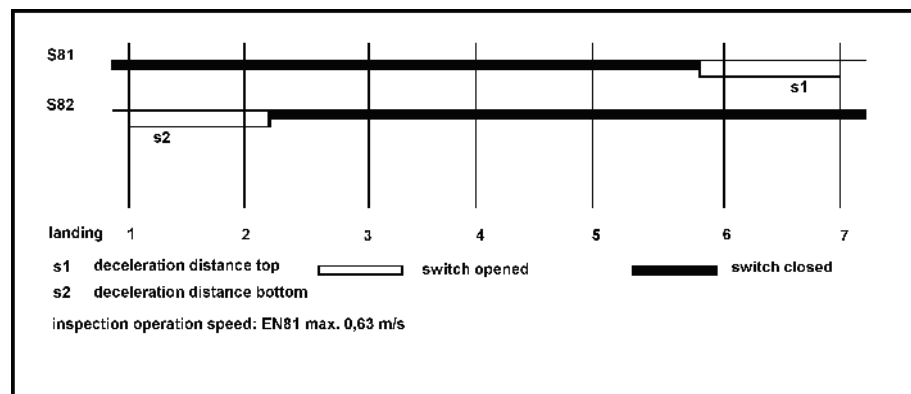
As soon as it possible to travel with inspection control, the transmitters of the well selection system can be mounted and installed. It can be either magnet switches, absolute rotary shaft encoders (AWG-05) or touchless transmitter systems such as USP or laser.

8.11.1 Installation of the Deceleration Switches



CAUTION!

For your personal security make sure that the inspection switch ON-OFF as well as the buttons UP-DOWN and EMERGENCY STOP have been wired in the safety circuit according to the circuit diagram. To have the first travels decelerated unless the absolute encoder has not yet been installed, first install the deceleration switches S81 and S82 for inspection and emergency control at the terminal landings putting them at their correct position in the well, and ascertain that they switch properly.



▲ **Picture 49**

Pulse-diagram of the deceleration switches.

Deceleration is initiated, when the switches in the direction of travel open accordingly. Deceleration switch S81 opens and starts deceleration for the topmost landing. Deceleration switch S82 opens and starts deceleration for the bottom landing. Deceleration of inspection and emergency travels has to start at these deceleration points as well. The flush-level position of the terminal landings must not be overtraveled.

In the service-menu please set the following:

- > SETTING
- > MAINTENANCE
- > MAINTENANCE SETTING
- > MAINTENANCE FUNCTIONS
- > FUNCTIONS

Scroll through this submenu until you get to the function INSPEC./EMERGENCY and there select INSTALLATION TRAVEL WITH DECELERATION SWITCHES S81/S82.

After that you can start travelling with inspection/emergency control in order to install the well selection system as described in chapter 6.6. In the menu MALFUNCTIONS you will find the message TRANSMITTERS NOT CONNECTED; in this operational mode, however, it serves for your information only and will not block the elevator.

8.11.2 Basic Settings

After having installed the CAN-transmitter system (see installation manual enclosed), do the following presetting in the basic menu of bp306:

Basic Menu: > PARAMETER
> ELEVATOR DATA
> WELL SELECTION > W/O SWITCHES (TRANSM.05 TO SP7 ONLY)

after that: > PORTS
> SERIAL PORTS
> PORTS CAN
> CAN DEVICES
> CAN-AWG, CAN-FU (INVERTER)
> CAN-AWG1, AWG2
> CAN-AWG1 (MAIN)
DEVICE: ON

after that: > PORTS
> SERIAL PORTS
> PORTS DC-AWG-DCP
> SERIAL PORT AWG
DEVICE PORT: CAN-AWG1 (MAIN)
RESOLUTION: 1024 DIG.
CIRCUMFERENCE: CIRCUMFERENCE OF THE SPROCKET APPLIED

Deceleration points and flush-level positions can comfortably be set by special setting menus.

In the service-menu the following basic settings have to be made:

Service menu: > SETTING
> MAINTENANCE
> MAINTENANCE SETTING
> ABSOLUTE ENCODING
> PARAMETER
> TRAVEL SPEED

Enter the nominal speed of the elevator in the range 0,3 to 3,5 m/s.

Go to this menu: > PARAMETER
> VIRTUAL WELL REPRESENTATION
> WELL PIT

Enter an approximate depth of the well pit, i.e. the distance between the sill of the bottom landing and the floor of the well pit. This value has been factory-preset to 0,5 m and is meant to obtain a well representation as precise as possible.

8.11.3 Read-In Travel with Absolute Encoder

After having done all these settings, you can initiate the read-in travel in compliance with the following instructions. During the course of the read-in travel the flush-level positions of every landing are precisely determined and memorized in the program memory. From the data gathered by the read-in travel combined with the parameters set, the control program computes the virtual well-selector.



INFO!

It is recommended, that two persons execute the read-in travel together. It is of utmost importance that the flush-level positions are approached and read-in with perfect precision, as the control system will compute the parameters of the landings from the values-read in.

Please proceed as follows:

1. Switch the elevator to the operation mode **INSPECTION**.
2. Activate the menu **ABSOLUTE ENCODING** and then the menu-item **READ-IN TRAVEL**. (It is possible to leave the program by pressing the **ESC**-button at any time.)
3. Make the elevator travel to the bottom landing (landing 1) as near as possible to the flush-level position. At a rope-traction elevator, you reach this precise position by means of the brake-release lever and the hand-wheel.
4. At a hydraulically operated elevator, approach the precise flush-level position of the bottom landing by operating the emergency valve or the hand-pump.
5. After having positioned the elevator flush with landing level 1, activate either the **CR**-button of the **LC**-display or the car call but-

ton of landing 1. To acknowledge the correct reading-in of the flush-level position, button 1 is lit.

6. Repeat this procedure for every other landing as well.

7. After having read in every flush-landing level position, you can switch the elevator back to normal operation mode.

Make the elevator approach every landing from both directions and check, whether the car stops at the flush-landing levels. Supposed that the read-in travel has properly been executed, you may nevertheless trace symmetrical inaccuracies at the landings at up- and down travels. They can be corrected in the virtual well-selector by adapting the parameters FLUSH LEVEL UP, FLUSH LEVEL DOWN.

The speed control, which counts increments from onsetting the deceleration to reaching the flush-level position, offers the possibility to compensate the deceleration distance VS down or up in the virtual well-selector depending on the flush-level discrepancy.

The responsivity in the relevelling area can be adjusted independently from the flush-level area.

Refer to service menu TIMES > HYDRAULIC / RELEVELLING

Refer to service menu TIMES > SPEED CONTROL / RELEVELLING

8.11.4 Starting Speeds

Starting speeds are to be set in the basic menu, menu-item STARTING SPEEDS.

m/s Vs	0,4	0,6	0,8	1,0	1,2	1,8
Seil	400	600	800	1000	1200	
Hydr.	320	600	1000	1400		
Seil geregelt B = 0,8 m/s	710	840	1130	1480	1870	2810

 **Picture 50**

Example of switch-off distances (mm) in the well

Vs = highest speed
Vn = relevelling speed
Vh = high speed
Vi = inspection speed
Vz = intermediate speed
Vr = emergency speed
Vm = medium speed
Vl = low speed



In connection with speed-controlled elevators you will have to adhere to the instructions of the manufacturer of the frequency inverter!

Deceleration distance Vs up = deceleration sets on towards the landing

Deceleration distance Vs down = deceleration sets on towards the landing

Stop flush down = shutdown threshold
Stop flush up = shutdown threshold

Relevelling flush down = relevelling to flush landing level
 Relevelling flush down = relevelling to flush landing level

Zone area down = switching threshold for door starting to open while car is slowing down to approach the landing resp. releveling

Zone area up = switching threshold for door starting to open while car is slowing down to approach the landing resp. releveling

Comment: door zone + releve zone = zone area

Pulse lugs in the menu W_{ELL} SIGNALS

- Installation Manual System »bp306« – Commissioning Instructions

value in order to have the well calibrated with effective values. It also defines the operating range of the transmitter.

- Transmitter Offset

Value is generally not changed. When exchanging the absolute encoder AWG-05 it has to be set anew.

8.11.5 Deceleration by S 81/S 82 with Normal Operation at the Terminal Landings

Some elevator owners have asked for an additional safety device for the terminal landings. It shall make sure that the elevator is switched to the low speed (VI) before reaching the terminal landing. Applying the deceleration switches S81 and S82 is a possibility to provide this supplementary safety function.

CAUTION!

It is essential for this application, that the deceleration switches S81 and S82 are mounted at the proper deceleration points and function perfectly.



Deceleration of a travel at maximum speed must set on at these deceleration points and the flush-level position of the terminal landings must not be overtraveled.

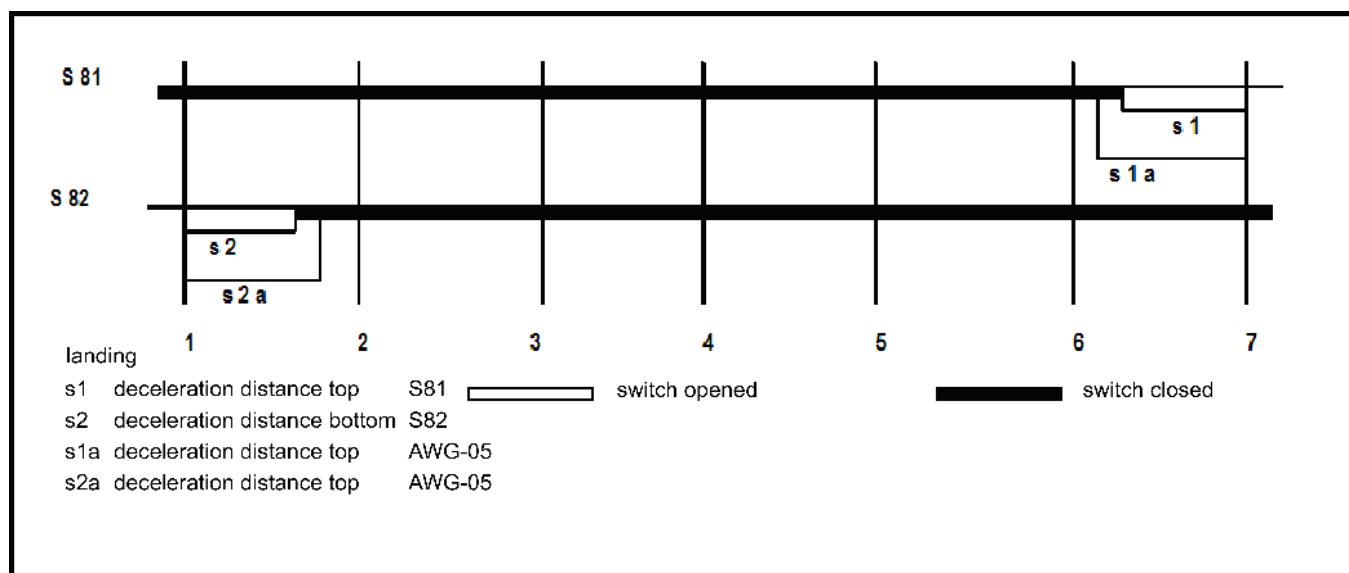
Deceleration is initiated by the switch related to the direction of travel. It opens accordingly.

Deceleration switch S81 is related to upward travels and opens to switch the elevator to low speed (VI) before it reaches the topmost landing.

Deceleration switch S82 is related to downward travels and opens to switch the elevator to low speed (VI) before it reaches to bottom landing.

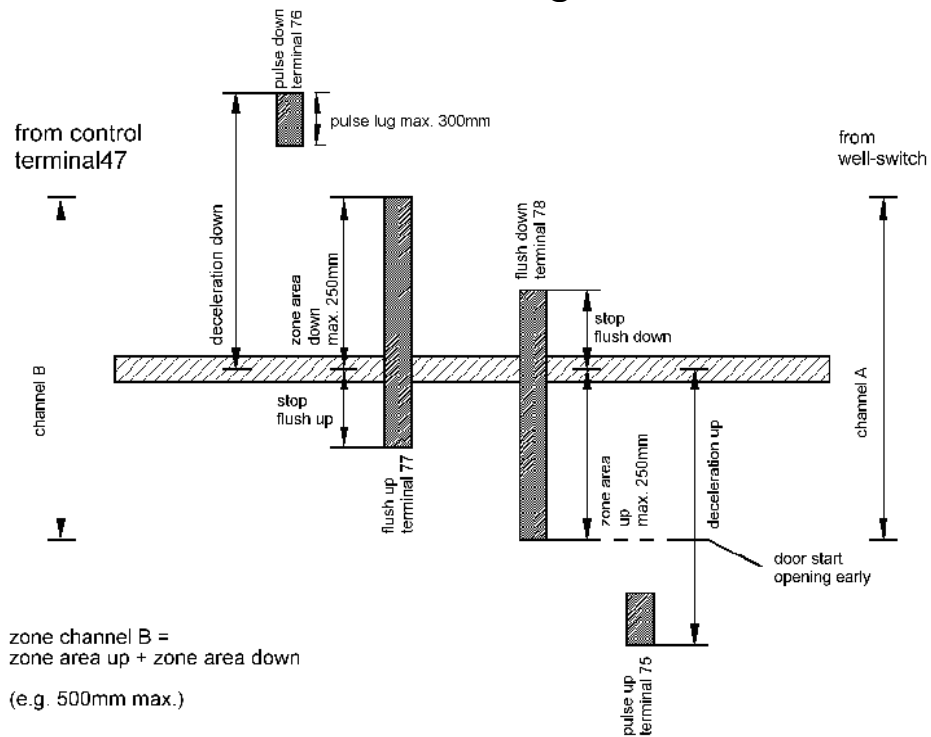
Setting in the basic menu:

- > PORTS
- > SERIAL PORTS
- > DC AWG DCP
- > SER. PORT AWG
- > ADDITIONAL CORRECTION SWITCHES:
- > WITH S81/S82



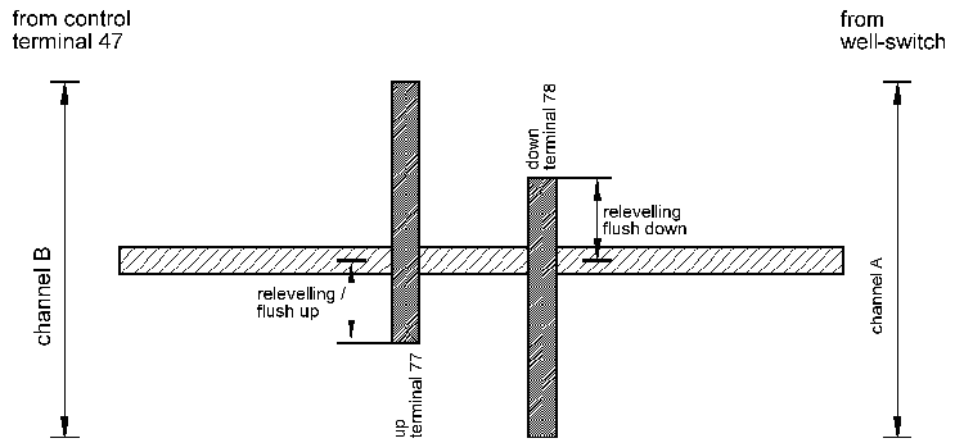
Picture 51
Pulse diagram with magnet switches and absolute encoder AWG-05

8.11.6 Pulse Diagrams of Absolute Encoder, without Short-Distance Landing



Picture 52

Pulse diagram related to deceleration distances in the flush-level area



zone channel B =
 zone area up + zone area down
 (e.g. 500mm max.)

▲ Picture 53

Pulse diagram related to the zones in the flush-level area

8.11.7 Pulse Diagram of Absolute Encoder with Short-Distance Landing



Also follow the safety instructions in chapter 2.

- Have you followed every item of the previous checklists (see chapters 8.5 and 8.6)? Fehler: Referenz nicht gefunden Yes ☐
- Is it that the LC-Display of bp306 does not display current malfunctions? Yes ☐
- Emergency control and inspection control are functioning as described in chapters 8.7 and 8.8. Yes ☐
- Emergency limit switches have been mounted, commissioned and their functions checked. Yes ☐
- Safety switches have been mounted, commissioned and their functions checked. Yes ☐
- Touch-down buffers have been mounted and their functions checked. Yes ☐
- Switching magnets in the well have been installed according to the pulse diagram. Yes ☐
- Correction switches have been mounted and commissioned according to the deceleration distance and their functions checked. Yes ☐
- Read-in travel for absolute encoder AWG-05 has been executed as described in chapter Fehler: Referenz nicht gefunden Yes ☐
- Read-in travel for drive unit has been executed as according to the manufacturer's instructions. Yes ☐
- In case of a DCP-connection to the inverter, the read-in travel has been executed following the DCP-parameters according to the description in chapter 8.6.4) Yes ☐
- The deceleration onset points have been adjusted in order to enable proper deceleration up to standstill. Yes ☐
- There is enough clearance each between the door-coupling blades mounted to the car door passing through the door-coupling rollers mounted to the landing doors. Yes ☐

If you have answered every question with »Yes«, you may continue as follows.

- Keep the doors closed, see maintenance menu. ☐
 - Switch landing controls off. ☐
 - By inspection or emergency control make the car travel to the flush-landing level position of either the topmost landing or the bottom landing. ☐
 - After having switched back to normal operation (inspection resp. emergency control off), the LCD displays the position of the topmost resp. bottom landing. ☐
 - Start the elevator as from the machine room by means of the call-button up resp. down in order to check free travel through the well. ☐
 - Check the incoming pulses from the well-selector in the menu DIAGNOSIS → WELL SIGNALS. ☐
 - Check the input and output signals in the menu DIAGNOSIS → SIGNALS. ☐
 - After the first proper travel, check flush-level position, brake onset points and - with speed-controlled elevators - the speed-control parameters and optimize them, if necessary. ☐
 - After that check the travel procedure by entering commands in the car operation panel. Do it as from every landing up and down. ☐
 - After that activate the landing controls and check the travel procedure by entering landing calls at every landing up and down. ☐
 - Check landing signals, out-of-operation signals and direction indicator. ☐
 - Check photocell, closing-force limiter, emergency alarm etc. ☐
- After that continue by optimizing the travelling behaviour.

8.13 Optimizing the Travelling Behaviour

After having executed the first normal travel with success, continue with the optimization of the travelling behaviour.

8.14 Commissioning the Emergency Call System

According to EN 81 28 every elevator must dispose of an emergency call system linked to a 24-hour service station. After having wired the emergency call unit as described in chapter 7.14.5 commission it according to the instructions enclosed and check its functions by emergency call tests.

8.15 Commissioning the Group Functions

If you have to commission a bank of elevators, first see to the correct function of each single lift and then link them in the group by the interconnection plugs. Check the group-parameters and switch the landing controls on to check, whether landing calls come in parallel to every elevator of the group.

After that switch the landing controls of all elevators off. Landing calls must not be accepted anymore. Now - one after the other - switch the landing control of each one elevator on again and check its landing-control functions.

8.16 Commissioning the Data Remote Diagnosis

As described in chapter 7.14, data remote diagnosis can be executed via different kinds of networks. If wiring has been done according to the circuit diagrams supplied, you can establish the data remote communication.



INFO!

To perfectly commission our software WinMOS®300 please follow the indications and instructions of the WinMOS®300-manual.

Be aware that you may unwittingly shutdown the elevator by entering erroneous parameters (e.g. setting run-time monitor a too low value).

If you want to connect a modem in parallel with an emergency call system to a mutual telephone extension, first ask BÖHNKE + PARTNER to approve it.

Although WinMOS®300 offers possibilities for the elevator-attendant function, this will not relieve the owner from his duty to make sure on site, that the safety devices of every elevator are not wittingly put out of operation or destroyed (e. g. emergency stop and emergency call).

Execution of software updates for the control unit or for functions of components that are essential for the elevator-functions are admissible only, if they are checked by personnel on site.

8.16.1 Commissioning of a Modem

If an analogous modem is applied for data remote diagnosis and it will have to correspond to the V.250-standard, the communication parameters can be entered after having completed the wiring. This includes above all the interface (integrated modem or data-communication port), the DC300-protocole, the telephone extension to be called in case of malfunctions or emergency. Furthermore, you should set the cases, in which feedback shall be given to the service station: every malfunction, in case of shutdown only, none.

8.16.2 Commissioning of a Network Access

If data remote diagnosis is to be executed via a network access, you will have to set the following parameters:

- ▶ Device port: DFÜ300
- ▶ Baud rate: 115200
- ▶ Parity: none
- ▶ Data format: 8 Bit
- ▶ Number of stopbits: 1 stopbit

- ▶ Modem device: Ethernet-Modul or no modem (ds) for external comserver)
- ▶ IP-address: e. g. 192.168.1.11
- ▶ Subnet-picture: e. g. 255.255.255.0
- ▶ Gateway: e. g. 192.168.1.1
- ▶ Port: e. g. 9000

INFO!

IP-Address, Subnet-picture and gateway are placed at your disposal by the network-administrator. Ports 8000 and 9000 must be available in the network . The protocole TCP/IP is used.

For more instructions concerning data remote diagnosis, please refer to the current WinMOS®300-manual.



8.17 Completing the Commissioning

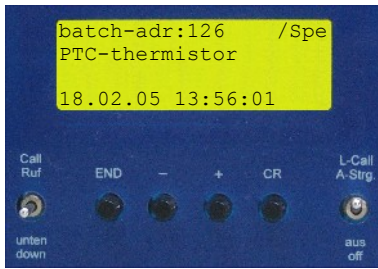
It is recommended to put a hardcopy of the current parameter set in the technical documentation of the plant as soon as commissioning has been completed. For that purpose, read the parameter set out from the control by WinMOS®300 and file the hardcopy in the technical documentation. If you do not dispose of WinMOS®300 note the parameter set in the hardcopy of the basic menu and service menu, which you will find enclosed.

Fault messages stored in the batch memory and the malfunction list during commissioning as well as the messages in the maintenance batch memory can be cancelled.

If third persons (e. g. janitor) have access to the system, please protect the access to the menus by assigning a basic and a service code.

9 Trouble-Shooting

Thanks to the digital structure of the control systems, a large number of possible reasons of malfunctions can be displayed in clear text. Normally, the reason can be found by these messages in the batch memory or malfunction list. If the elevator has been shut down due to a malfunction, the background of the LC-Display flashes and the abbreviation »Spe« (Sperre = blocking) is displayed as well. To find out the precise reason of the malfunction, please refer to the batch memory or the malfunction list. After having eliminated the reason of the malfunction, eliminate the blocking as well by a reset of the installation (switch the command button on the left side up).



Picture 55

An entry in the batch memory with blocking

Sporadic faults often are to be traced in EMC-problems. Should you have any question concerning electro-magnetic compatibility, please contact our service team, who will be pleased to be of service to you.

9.1 Monitoring Routines

The bp306 software monitors a lot of signals with regard to their turn-off level and time characteristics. If any discrepancy arises, an according fault message will be stored in the batch memory and provided with a time-punch. From the malfunction list you can read how often this fault occurred.

If a preset checktime or monitoring time (e. g. starting time check, runtime monitoring, deceleration monitoring) is exceeded, the elevator will be shut down and all travel commands cancelled. If any warning device responds, the elevator will be shut down at the next landing ahead and blocked. Warning devices are for example: motor overload switch, pressure switch and overtemperature switch of the hydraulic system.

If the safety circuit responds, the travel will be interrupted and all travel commands deleted.

The door lock monitoring, if responding, will as well make the travel commands being deleted. The door lock monitoring responds after three fruitless attempts.

Flush-level position of the car is monitored by absolute encoder or flush-level switches. If the motionless car leaves the flush-level position, it will be releveled, if necessary even with open doors thanks to the safety circuitry SMZ-04 that correspondingly bypasses the door and locking contacts.

► PTC thermistor.

Terminals PTC / PTC, it is possible to monitor any common positive-temperature thermistor.

► Overload terminal 20.

Terminals 100 / 20. Maximum output current 2,5 resp. 5 A.

► Excess voltage in the system.

Terminals 100 / 20 / PE. For connecting refer to STM-02

► Runtime monitoring.

Monitors starting, high-speed travel and low-speed travel phases. Refer to the menu »checktimes«.

► Contactor release (terminal 33).

Release of the drive contactor is checked prior to starting.

► Brake release (terminal 35).

Release of the brake-jaws is checked by contacts prior to starting.

- ▶ Door and locking check.
Monitors closing of the safety circuit. Refer to the menu »check-times«.
- ▶ Safety circuitry.
Monitors input and output signal of the integrated SMZ-04 (safety module zone).
- ▶ Speed controls / LRV (terminal 34).
Monitors the malfunction output of the frequency inverter.
- ▶ Brake release / activation (terminal 31)
Monitors the output »mechanical brake« of the frequency inverter.
- ▶ Pulses / flush-level position / correction (terminals 71-78)
Will monitor plausibility of the well signals, if no absolute encoder is applied.
- ▶ Relevelling (w/o absolute encoder, terminals 73-74 / 77-78).
Monitors 20 times and 20 seconds per travel direction and per landing.
- ▶ Safety circuit (terminals 9, 15, 16, 17-18, 19).
Monitors standstill as well as travels.
- ▶ Correction signal / absolute encoder (terminals 71-72, RS485).
Monitors plausibility of the well-signals.
- ▶ Blocking.
Some monitoring functions may have been parameterized by a blocking.

TIP CONCERNING MONITORING!

Monitoring functions are directly displayed in the menu OPERATION DATA → MALFUNCTIONS. Malfunctions are registered and stored in the batch memory and the malfunction list.



9.2 Malfunction Information

Malfunctions infringe the elevator control functions in a way that proper operation will not be possible anymore. Every current event is displayed that has resulted in a malfunction of the elevator, e. g.:

- ▶ Speed governor has responded, terminal 9 of the passive safety circuit,
- ▶ PTC-thermistor of drive motor resp. hydraulic unit has responded.
- ▶ Start time check, travel check, deceleration check,
- ▶ Brake monitoring, contactor monitoring
- ▶ Malfunction of the well-selector,
- ▶ Malfunction of the frequency inverter,
- ▶ Safety circuitry.

If a malfunction occurs, it will be registered in the batch memory and the malfunction list. Provided that the plant is connected to a WinMOS®300-Remote Diagnostics System a callback can be initiated if a malfunction has occurred. If a critical fault occurs, it can result in a shutdown of the plant. After having eliminated the fault you can put the plant in operation again by reset. Reset can be initiated by activating the switch up&down or by shortly switching off the mains voltage.

Faults that are not so serious, such as for example door locking faults can be reset by entering a new call.

9.3 Reporting of Malfunctions

Every bp306 has been prepared for remote diagnostics. If there is no modem integrated in the printed-circuit board BPC, an external modem or comserver can be connected to the DC-port.

Provided that in the basic menu calling back upon a malfunction-report has been activated, a malfunction will be reported to the service centre by stating the kind of malfunction, date and time.

For more information concerning remote diagnostics refer to the WinMOS®300 manual or to www.WinMOS.de.

9.4 Batch Memory

The batch memory comprises the latest 128 malfunctions in chronological order, editing them together with a time-punch. A display-routine enables you to have the fault messages edited in clear text on the LC-Display, stating:

- ▶ Date,
- ▶ Time,
- ▶ Malfunction,
- ▶ Landing, if the malfunction is correlated with it.

Example:

```
Batch address: 121
Malfunction safety circuitry
Terminal 42=0→Terminal32=1 Stop
18.2.05 13:55:34
```

This enables you to reconstruct the history of the latest malfunctions.

When you leave the display-routine, the LCD asks, if the batch memory is to be deleted. In order to dispose of a stringent protocole, we strongly recommend to delete the batch memory only after having transmitted the entries to the WinMOS®300-centre station.

9.5 Malfunction List

The malfunction list stores the frequency of occurrence of all malfunctions registered. On the display figure:

- ▶ Malfunction,
- ▶ Frequency of occurrence,
- ▶ Landing, if the malfunction is correlated with it.

Thanks to a display routine, the malfunction list can be read from the LC-Display in clear text.

When you leave the display-routine, the LCD asks, if the malfunction list is to be deleted. In order to dispose of a stringent protocole, we strongly recommend to delete the malfunction list only after having transmitted the entries to the WinMOS®300-centre station.

9.6 Explanation of the Malfunction Information

This is a summary of some selected malfunctions, possible reasons and the related entries in the batch memory:

Malfunction:	DOOR + LOCKING CHECK IN THE WELL
Reason:	Lock and door contact have been interrupted during correction travel, when car had not yet reached a landing position (elevators with magnet switches)
Entry:	Door + lock contact in well
Malfunction:	X 5.9 * ELEVATOR SHUT DOWN
Reason:	Interruption of passive safety circuit at terminal X 5.9.
Entry:	Malfunction X 5.9 while travelling to landing: X (if not blocked) Malfunction X 5.9 (if elevator is blocked) in basic menu (Malfunction variable depending on the setting in the basic menu blocked or not blocked)
Malfunction:	LOCK. X 5.19 STANDSTILL
Reason:	After three locking attempts prior to starting the lock contact could not be closed.
Entry:	Lock X 5.19 standstill at landing: X
Malfunction:	LOCK. X 5.19 TRAVEL
Reason:	Lock contact terminal X 5.19 interrupted during travel.
Entry:	Lock X 5.19 travel to landing: X
Malfunction:	DOOR X 5.18 STANDSTILL
Reason:	Car door contact door B is not closed at standstill.
Entry:	DOOR X 5.18 standstill at landing: X
Malfunction:	TERMINAL X5/18 TRAVEL
Reason:	Car door contact door B is interrupted while travelling.
Entry:	Door X 5.18 travel to landing: X
Malfunction:	DOOR X 5.17 STANDSTILL
Reason:	Car door contact door A is not closed at standstill.
Entry:	DOOR X 5.17 standstill at landing: X
Malfunction:	TERMINAL X5/17 TRAVEL
Reason:	Car door contact door A is interrupted while travelling.
Entry:	Door X 5.17 travel to landing: X

Malfunction: DOOR X 5.16 STANDSTILL
 Reason: Automatically operated sliding doors with landing door contact.
 Entry: Door X 5.16 standstill at landing: X

Malfunction: DOOR X 5.16 TRAVEL
 Reason: Landing door contact has been interrupted while travelling.
 Entry: Door X 5.16 travel to landing: X

Malfunction: Malfunction LIGHT VOLTAGE
 Reason: Failure of light voltage or emergency illumination defective.
 Entry: Malfunction light voltage

Malfunction: Malfunction SAFETY MODULE ZONE
 Reason: General tip that the message signal from SMZ-04 was not given
 (e. g.: as a zone signal is missing).
 Entry: Malf. safety module zone terminal 32=0 / ABC=1 Stop

Malfunction: Malfunction SAFETY MODULE ZONE * ELEVATOR SHUT DOWN *
 Reason: An irregularity in the safety module zone (SMZ-04),
 missing signals. Specified message to malfunction list
 Entry: Malf. Safety Module Zone
 Malf. Terminal 32 standstill
 Malf. Terminal 32 travel
 Terminal 32=0 / Stop

Malfunction: Malfunction RELEVELLING
 Reason: Relevelling conditions as required for the relevelling procedure
 (e. g.: the zone), are missing, when relevelling is to be initiated, or both
 relevelling signals are set simultaneously.
 Entry: Malfunction relevelling both sides =1
 Malfunction relevelling: no zone

Malfunction: ZONE W/O FLUSH-LEVEL
 Reason: Zone switch has already been activated before reaching the
 flush-level switch.
 Entry: Malfunction safety circuitry: zone w/o flush-level

Malfunction: COUNTING ERROR DOWN
 Reason: During travel down an error occurred in counting the down-pulses.
 Entry: Malfunction pulse-transmitter, number of down-pulses exceeded.
 Malfunction pulse-transmitter: number of down-pulses remained below.
 (applicable for plants with magnet-switches only)

Malfunction: COUNTING ERROR UP
Reason: During a travel up an error occurred in counting the up-pulses.
Entry: Malfunction pulse-transmitter, number of up-pulses exceeded.
 Malfunction pulse-transmitter, number of up-pulses remained below.
 (applicable for plants with magnet-switches only)

Malfunction: COUNTING ERROR DOWN OR UP
 V2 AT CORRECTION SWITCH
Reason: Pre-limit switches at terminal landing have not been activated.
Entry: Malfunction of pulse-transmitter: V2 at correction switch top/bottom
 (applicable for plants with magnet-switches only)

Malfunction: BOTH CORRECTION SIGNALS AT ONE TIME
Reason: Correction switches are normally open but are both closed at the same time.
Entry: Malfunction pulse transmitter both correction signals at one time.
 (applicable for plants with magnet-switches only.)

Malfunction: CORRECTION SIGNAL MISSING
Reason: Correction switches are normally closed but are both open at the same time.
Entry: Malfunction pulse transmitter: no correction signal.
 (applicable for plants with magnet-switches only.)

Malfunction: PRE-LIMIT SWITCHES TOP/BOTTOM?
Reason: Both pre-limit switches top and bottom are activated at the same time.
Entry: Malfunction pulse-transmitter: pre-limit switches top and bottom?
 (applicable for plants with magnet-switches only.)

Malfunction: PRE-LIMIT SWITCH BOTTOM MISSING
Reason: Information that pre-limit switch of bottom landing is missing.
Entry: Malfunction pulse-transmitter: pre-limit switch of bottom landing is missing. (applicable for plants with magnet-switches only.)

Malfunction: PRE-LIMIT SWITCH TOP MISSING
Reason: Information that pre-limit switch of topmost landing is missing.
Entry: Malfunction pulse-transmitter: pre-limit switch of topmost landing is missing. (applicable for plants with magnet-switches only.)

Malfunction: NO CONNECTION TO ENCODER
Reason: Control unit does not trace the absolute encoder: either the conduction route or the parameter set of the absolute encoder is defective/erroneous.
Entry: Malfunction absolute encoder: no connection

Malfunction: TRANSMITTER OUT OF RANGE
 Reason: Transmitter position is not within the range of sensing.
 Entry: Malfunction pulse-generator: transmitter outside range of sensing

Malfunction: TRANSMITTER SENSE OF ROTATION IS WRONG
 Reason: Sense of rotation of the transmitter does not correspond to that of the absolute encoder.
 Entry: Transmitter: sense of rotation is wrong.

Malfunction: TRANSMITTER INTERNAL FAULT
 Reason: Transmitter has traced an internal fault (transmitter to be exchanged).
 Entry: Transmitter: internal fault.

Malfunction: DCP - CONNECTION DEFECTIVE
 Reason: No connection between DCP-interface and interface of inverter.
 Entry: DCP-connection defective

Malfunction: NO CONNECTION TO SLP
 Reason: There is not connection between the interface SP2 and the interface of the serial power-board SLP-02 in the inspection control box.
 Entry: SLP-connection defective

Malfunction: START MONITORING
 Reason: Despite an attempt elevator did not start moving within the start monitoring interval preset in the service menu.
 Entry: Start monitoring responded at landing: x

Malfunction: RUNTIME MONITORING. * Elevator shut down *
 Reason: If there is not traced any step-pulse within the runtime monitoring time preset in the service menu, the travel will be interrupted.
 Entry: Runtime monitoring.

Malfunction: DECELERATION MONITORING
 Reason: The deceleration monitoring time preset in the service menu was exceeded. The value set refers to the time interval elapsing during the travel from switching point to flush-level position.
 Entry: Deceleration monitoring at landing: x

Malfunction: EMERGENCY STOP + CALL BLOCKING
 Reason: In the basic menu the function "emergency stop + call blocking" has been preset, therefore at this state no calls will be accepted.
 Entry: according to the setting in the basic menu

Malfunction: Malfunction BRAKE ACTIVATION * ELEVATOR SHUT DOWN *
 Reason: Signal terminal 35 is not cancelled upon stopping.

Entry: Malfunction brake activation.

Malfunction: Malfunction CONTACTOR RELEASE * ELEVATOR SHUT DOWN *

Reason: Normally closed contacts of the power-contactors are wired in line to terminal 33. Signal was not set to one upon stopping.

Entry: Malfunction of contactor release

Malfunction: Malfunction of BRAKE RELEASE * ELEVATOR SHUT DOWN *

Reason: When starting the signal was missing that released the brake mechanically.

Entry: Malfunction of brake release.

Malfunction: Malfunction TERMINAL 30

Reason: The malfunction occurred that is defined by terminal 30.
(View in service menu under Basic info → Parameter → Functions → Terminals).

Entry: The malfunction defined by terminal 30 is displayed.
Example: transmitter system other make, deceleration-monitoring circuit, etc.)

Malfunction: LIGHTSCREEN DOOR A/B/C
* ELEVATOR SHUT DOWN *

contactor release K 241 / 242 door side A
contactor release K 243 / 244 door side B
contactor release K 245 / 246 door side C

Reason: At the starting attempt the self-test of the safety photocells failed.

Entry: Malfunction light screen contactor release K 241 / 242
Malfunction light screen contactor release K 243 / 244
Malfunction light screen contactor release K 245 / 246

Malfunction: Malfunction SPEED CONTROL DSV OVERLOAD A6

Reason: Elevator is equipped with a frequency inverter make Dietz.
It has traced that the admissible load was exceeded.

Entry: Malfunction speed control DSV overload A6

Malfunction: Malfunction SPEED CONTROL DSV EXCESS SPEED OF ROT. A3.

Reason: Elevator is equipped with a frequency inverter make Dietz.
It has traced that the admissible speed of rotation was exceeded.

Entry: Malfunction speed control excess speed of rotation A3.

Malfunction: Malfunction TERMINAL 31 AT START
 Reason: No signal from speed control terminal 31 (brake release) upon starting.
 Travel is interrupted.
 Entry: Malfunction speed control terminal 31 at start.

Malfunction: Malfunction TERMINAL 31 AT STOP
 Reason: Signal terminal 31 of inverter was not set to zero upon stopping.
 (brake activation/release)
 Entry: Malfunction speed control terminal 31 at stop.

Malfunction: Malfunction TERMINAL 31 AT TRAVEL
 Reason: Signal terminal 31 of inverter (brake activation/release) was set to zero
 during travel
 Entry: Malfunction speed control terminal 31 at travel.

Malfunction: Malfunction SPEED CONTROL (tip: batch-memory)
 Reason: While starting the collective malfunction signal of the inverter was set to
 zero.
 Entry: Malfunction speed control terminal 34 start

Malfunction: Malfunction SPEED CONTROL (tip: batch-memory)
 Reason: The collective malfunction signal of the inverter is zero at standstill.
 Entry: Malfunction speed control terminal 34 standstill

Malfunction: Malfunction SPEED CONTROL (tip: batch-memory)
 Reason: The collective malfunction signal of the inverter was set to zero during
 travel.
 Entry: Malfunction speed control terminal 34 during travel

Malfunction: PTC-THERMISTOR
 Reason: PTC-thermistor of the elevator motor responded. Drive unit is
 overheated.
 Entry: PTC-thermistor

Malfunction: Malfunction INVERTER TERMINAL 31 ANTE ZONE
 Reason: Inverter has given the brake-signal before reaching the zone.
 Entry: Malfunction inverter KI. 31 ante zone

Malfunction: Malfunction INVERTER TERMINAL 34
 Reason: Collective fault message of inverter was set to zero.
 Entry: Malfunction inverter terminal 34 at standstill
 Malfunction inverter terminal 34 at start,
 Malfunction inverter terminal 34 at travel,
 Malfunction inverter terminal 34 at stop,
 Malfunction inverter terminal 34 at stop (Dietz)

Malfunction: Malfunction INVERTER DCP
Reason: Inverter reports one of the following malfunctions by sending a message.
Entry: Malfunction inverter DCP: S1=0 at start (contactor release)
 Malfunction inverter DCP: S3=1 at start (collective fault-message)
 Malfunction inverter DCP: S6=? at start (brake)
 Malfunction inverter DCP: S0=0 at travel (inverter not ready)
 Malfunction inverter DCP: S1=0 at travel (contactor release)
 Malfunction inverter DCP: S3=1 at travel (collective fault message)
 Malfunction inverter DCP: S6=? at travel (brake)

Malfunction: Malfunction FLUSH-LEVEL POSITION OVERTRAVELED.
Reason: At stop down the flush-level switch is overtraveled. Increase braking force.
Entry: Malfunction flush-level position overtraveled at landing X

Malfunction: Malfunction SAFETY MODULE ZONE; * ELEVATOR SHUT DOWN *
Reason: A malfunction occurred within the area of the safety module zone (SMZ). Signals are missing such as e. g. a zone signal or the signal $V < 0,3\text{m/s}$
Entry: Specified information in the batch-memory
 Malfunction terminal 42=0 / terminal 32=1 at stop (SMZ defective resp. Output terminal 42)
 Malfunction terminal 32 at start (SMZ defective resp. output terminal 42)
 Malfunction terminal 32 at travel (signals faulty)
 Zone lost at deceleration terminal 32=0 (check zone signals)
 Zone too short terminal 32=0 / terminal 42=1 at stop (check zone magnets)
 Reaching flush-level position too late while doors are starting to open (reduce zone resp. enlargen flush-level area)
 Zone without flush-level (zone switches activated before flush-level switches)

Malfunction: Malfunction MACHINE-ROOM TEMPERATURE
Reason: Thermostat responded that monitors the machine-room temperature terminal 38.
Entry: Malfunction machine-room temperature

Malfunction: BODE SINKING PREVENTING DEVICE * ELEVATOR SHUT DOWN *
Reason: A malfunction occurred with the Bode sinking preventing device.
Entry: Bode safety contactor terminal 221=0 prior to start (contactor not released)
 Bode contact terminal 222=0 prior to start (magnet not released)
 Bode safety contactor terminal 221=0 after start (contactor not activated)
 Bode contact at start terminal 222=0 at start (magnet does not respond)

Bode safety contactor terminal 221=1 at travel (contactor released at travel)

Bode contact terminal 222=1 at travel (magnet released at travel)

Bode safety contactor terminal 221=0 after start (contactor does not release)

Bode contact at stop terminal 222=0 at stop (magnet does not release after stop)

Malfunction: Malfunction RELEVELLING 20 X UPWARDS

Reason: Relevelling was required more than 20 times at a landing.

Possible reason: untight plunger

Entry: according to your setting in the basic menu

Malfunction: Malfunction RELEVELLING 20 X DOWNWARDS

Reason: Relevelling was required more than 20 times at a landing.

Reason to be traced in the hydraulic system.

Entry: according to your setting in the basic menu.

Malfunction: Malfunction RELEVELLING TIME UP/DOWN

Reason: Fixed time between initiation of relevelling and reaching the flush-level position again was exceeded.

Entry: according to your setting in the basic menu

9.7 Messages

Messages inform you that the elevator is being available to a restricted extent only and cannot be used with its full capability. Reported are all data that resulted in the message such as for example:

- ▶ Landing controls switched off.
- ▶ Emergency stop activated in the car.
- ▶ Inspection controls switched on.
- ▶ Emergency controls switched on.
- ▶ Car priority functions switched on.
- ▶ Priority commands to be worked off.
- ▶ Fullload resp. overload contact has responded.
- ▶ Fire emergency / brigade controls are switched on.
- ▶ Emergency power supply activated.
- ▶ Elevator taken off the group.
- ▶ Car travelling to parking landing.
- ▶ Car at parking landing.

9.8 Explanation of the Messages

Message: ELEVATOR WITHOUT POSITION INFO

Reason: No position info available for the elevator. Correction travel required!

Message: LANDING CONTROLS OFF

Reason: Landing controls switch off, toggle switch of bp306 or terminal 85!

Message: CAR PRIORITY ON

Reason: Car priority activated at terminal 84!

Message: EMERGENCY STOP / EMERGENCY STOP SWITCH ACTIVATED

Reason: Emergency stop activated either in car or on the inspection control box!

Message: PRIORITY CALL

Reason: Priority call entered at a landing!

Message: FULLOAD ACTIVE

Reason: Car is fully loaded. Car commands are worked off only!

Message: OVERLOAD ON

Reason: Car is overloaded. Neither car commands nor landing calls are accepted!

Message: REMOTE STOP DOWN ACTIVATED

Reason: Elevator was externally stopped down via terminal 37 "remote stop down"!

Message: START OFF MONITORING

Reason: This message occurs in groups, in which the elevator, which the command was allocated to, cannot start due to a real operation state (e.g. "door open"-button was activated)!

Message: NO GROUP CONNECTION

Reason: Group connection was interrupted by a defect of the BPC (interface), of the PWK or of the conduction path to the next control unit!

Message: SAFETY PHOTOCELL A / B / C INTERRUPTED DURING TRAVEL

Reason: Safety photocells of a maximum of three doors (A/B/C) have responded.
Message will also be given, if one or two doors are available only!

Message: ALL LANDINGS SHUT DOWN BY INPUT

Reason: All landings are shutdown by input signals!

Message: INSPECTION ON

Reason: Inspection control on car is switched on!

Message: EMERGENCY CONTROL IS ON

Reason: Emergency control unit in control cabinet is switched on!

Message: ATTENDANT CONTROL SWITCHED ON

Reason: Calls are worked off in the attendant control function!

Message: AVAILABILITY TIME IS RUNNING OFF

Reason: The time preset to expire before normal operation is assumed again after having worked off a landing priority call is running off!

Message: FIRE EMERGENCY / EVACUATION

Reason: External fire-emergency message at terminal 124, including approach to the landing preset!

Message: FIRE BRIGADE OPERATION CAR

Reason: Fire brigade operation was activated in the car, terminal 126!

Message: FIRE BRIGADE OPERATION LANDING

Reason: Fire brigade operation was activated at the landing including approach to the
landing preset, terminal 125!

Message: EMERGENCY POWER ON

Reason: Plant is fed with emergency power!

Message: EMERGENCY-POWERED TRAVEL

Reason: Evacuation travel to the landing preset for cases of emergency-powering!

Message: REMAINS OPERATIVE ALSO WITH EMERGENCY POWER

Reason: Information that elevator can normally be operated with emergency power!

Message: MAINTENANCE ON

Reason: Maintenance operation activated (by field engineer prior to maintenance work!)

Message: ELEVATOR AVAILABLE

Reason: By terminal 38 the elevator was made to travel to the "availability landing".
The message is cancelled as soon as this signal at terminal 38 is void!

Message: PHOTOCCELL DOOR A > 30 SEC.

Reason: This message will be given, if the input of photocell door A is activated for more than 30 seconds!

Message: PHOTOCCELL DOOR B > 30 SEC.

Reason: This message will be given, if the input of photocell door B is activated for more than 30 seconds!

Message: PHOTOCCELL DOOR C > 30 SEC.

Reason: This message will be given, if the input of photocell door C is activated for more than 30 seconds!

Message: LOADING TIME DOOR A IS RUNNING OFF

Reason: The loading button of door A has been activated. Door A remains open for a loading time as long as preset in the menu »door times« !

Message: LOADING TIME DOOR B IS RUNNING OFF

Reason: The loading button of door B has been activated. Door B remains open for a loading time as long as preset in the menu »door times« !

Message: LOADING TIME DOOR C IS RUNNING OFF

Reason: The loading button of door C has been activated. Door C remains open for a loading time as long as preset in the menu »door times« !

Message: FAULT MESSAGE DOORS (5 X 3)

Reason: If the safety circuit cannot be closed due to a defective door or lock contact, the door closing procedure will be repeated twice. If the door and lock contacts still have not been closed after that, the calls available at the landings will be deleted and the elevator idle. After a new command, the door closing procedure will be initiated another three times. After a total of five fruitless procedures, a fault message will be entered in the batch-memory "fault message doors (5x3)"!

Message: ELEVATOR "OUT OF OPERATION"

Reason: This will be entered if the elevator was taken off the normal operation due to an according input signal (e. g.: activity of the following functions: inspection, emergency fire-brigade operation, fire emergency or remote shutdown)!

Message: ZERO LOAD ON

Reason: Information that a car with zero-load is to accept not more than the number of calls than preset in the menu under FUNCTIONS → NUMBER OF CALLS WITH ZERO LOAD!

Message: ELEVATOR OCCUPIED (AUTOMATIC CONTROL - SFS)

Reason: Message refers to automatic control, saying that the car is traveling or standing at a landing with open doors!

Message: DOCKING CONTROL ACTIVE

Reason: This message says that the elevator is being operated in the mode »docking

control«, i.e. being positioned at a stage by means of a pear-shaped two-button control unit (like dead-man control)!

Message: READ-IN TRAVEL ACTIVE (FOR DATA REMOTE TRANSMISSION)

Reason: A data-remote-transmission message given in cases where a read-in travel is executed!

Message: ABSOLUTE ENCODER OK!

Reason: Elevator is equipped with absolute encoder and connection to is all right!

Message: READ-IN TRAVEL REQUIRED

Reason: Message is given after switching from inspection operation to normal operation, provided that no read-in travel was done after commissioning, from which flush-level positions would have resulted!

Message: WAITING FOR START-BUTTON TO BE PRESSED

Reason: Says that in the attendant control mode first the commands are to be entered and then the start-button to be pressed in order to work off the commands!

Message: PROGR. "ARRIVING"

Reason: If there is a 24 V-signal at terminal 143, the elevator will always travel to the "waiting landing/arriving" and wait there as long as the signal is not cancelled.

Message: PROGR. "LEAVING"

Reason: If there is a 24 V-signal at terminal 143, the elevator will always travel to the "waiting landing/leaving" and wait there as long as the signal is not cancelled.

Message: DOOR TABLE 2 ACTIVE

Reason: At terminal 84, the 2nd door table was switched to be active. This function shall serve for temporary blocking of certain landings!

Message: TIMER PARKING

Reason: In the menu-item TIMER PARKING the time is preset at which the parking landing is active!

Message: PARKING LANDING ACTIVATED VIA E24-28

Reason: This message will be given, if the function »Parking Landing« is to be externally activated via an input!

Message: ELEVAT.TRAVELLING TO CONTROL LANDING

Reason: This message will be given, if the elevator is travelling to the landing preset in the service menu to be the control landing, where you can inspect it!

Message: ELEVAT.TRAVELLING TO HOME LANDING

Reason: Function »remote off« (terminal 37) was activated. The elevator travels to the landing preset in the service menu to be the home landing!

Message: ELEVAT.TRAVELLING TO WAITING LANDING

Reason: If the function »ARRIVING« (terminal 143) or »LEAVING« (terminal 144) is activated, this message will be given. It will also be given, if at terminal 38 the function »MAKE ELEVATOR AVAILABLE« is activated!

Message: ELEVAT.TRAVELLING TO HOME LANDING

Reason: As soon as the »TIME PRIOR TO RETURNING« preset in the service menu of the hydraulically operated elevator has expired, the elevator travels to the home landing!

Message: HOME POSITION

Reason: Elevator is idle at the landing preset in the service menu for this purpose!

Message: HOME LANDING

Reason: The lowest landing of the hydraulically operated elevator, to which it travels as soon as the time prior to return will have expired!

Message: PARKING LANDING

Reason: The landing preset in the service menu, where the elevator returns to as soon as the time prior to parking will have expired.

9.9 Repair Work

Should a fault in the control electronics be demonstrable, it can not be recommended to repair it on site, as this would not be economical. To save time and money, please call us and state the serial number of the control unit and the circuit diagrams.

10 Maintenance

During the course of common maintenance, check the following with the control systems bp306:



▲ **Picture 56**

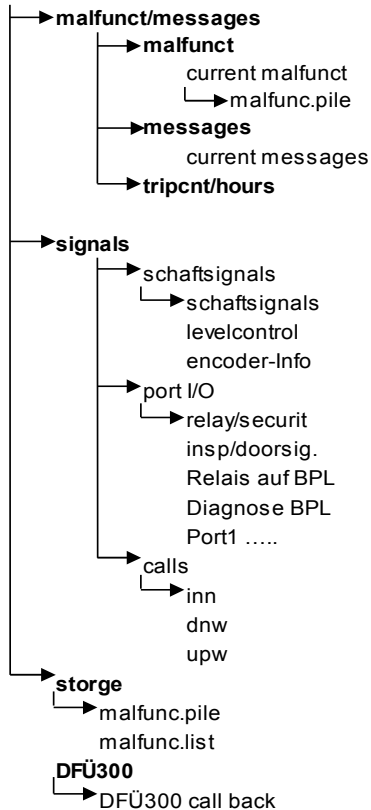
The control system bp306 is easy to maintain. It can automatically inform you, if maintenance has become necessary.

- ▶ General visual check for possible dust, moisture or corrosion. If necessary, polish it off.
- ▶ Are all connections to the control unit proper and tight?
- ▶ Do batch memory and malfunction list display any malfunction? Check the malfunctions registered and, where given, eliminate and delete them.
- ▶ Make sure that the accumulator of the emergency illumination is capable to illuminate the car for 1 hour.
- ▶ If applicable: Pay attention to the maintenance-instructions in the manual of your USV (uninterruptible power supply).
- ▶ Under normal conditions the toothed belt of your absolute encoder system needs no maintenance. In case of heavy duty, however, or if it produces noise, it will be recommendable to treat the running surface of the toothed belt with the talcum supplied or with silicone-spray.

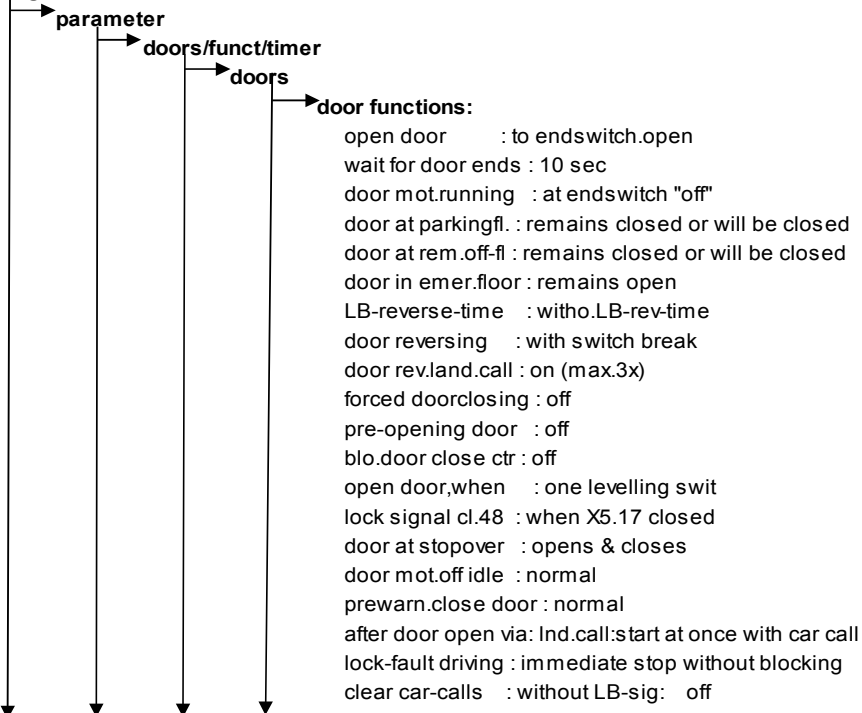
Appendix

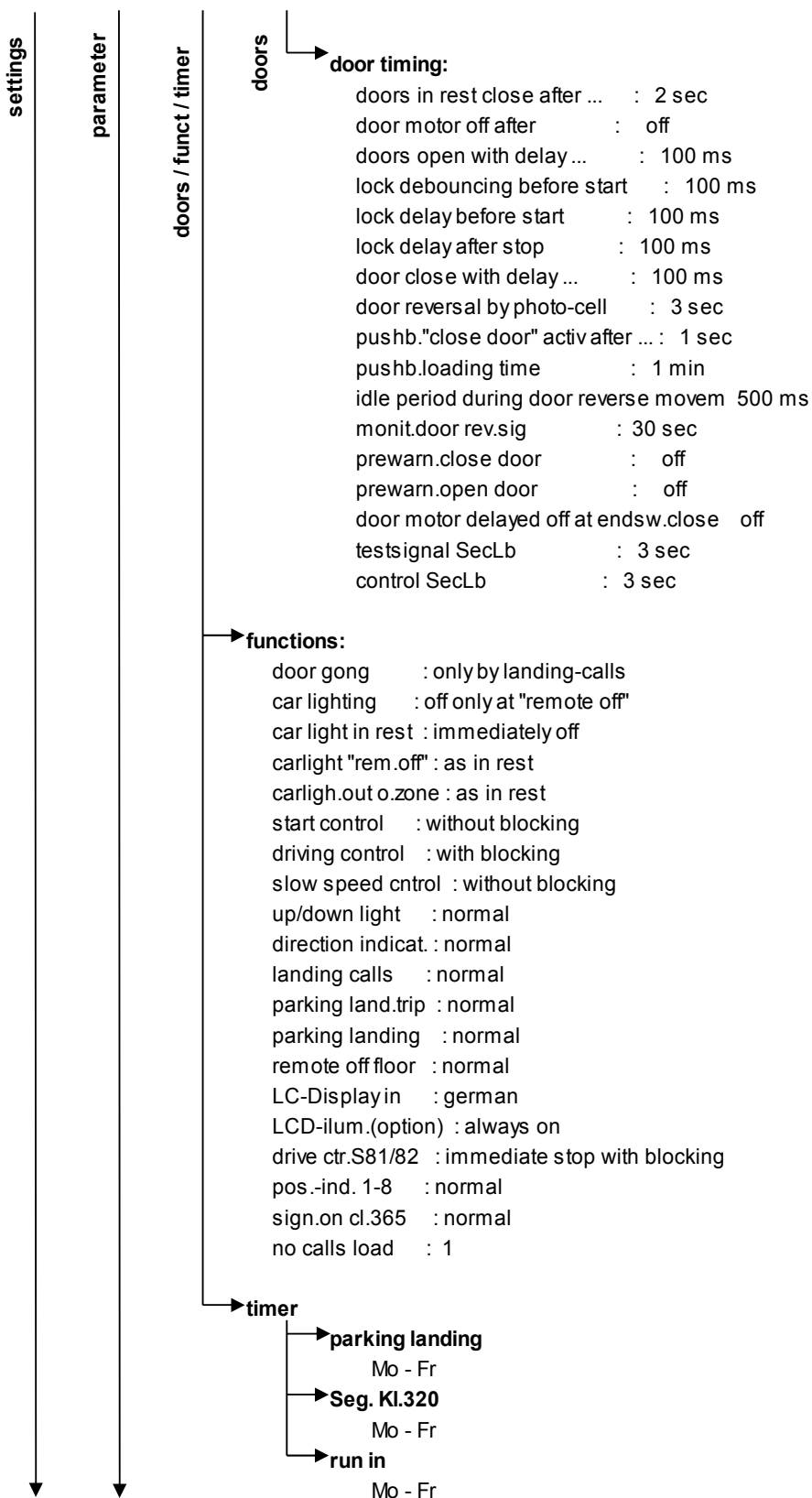
A Service Menu Quick Reference

diagnosis

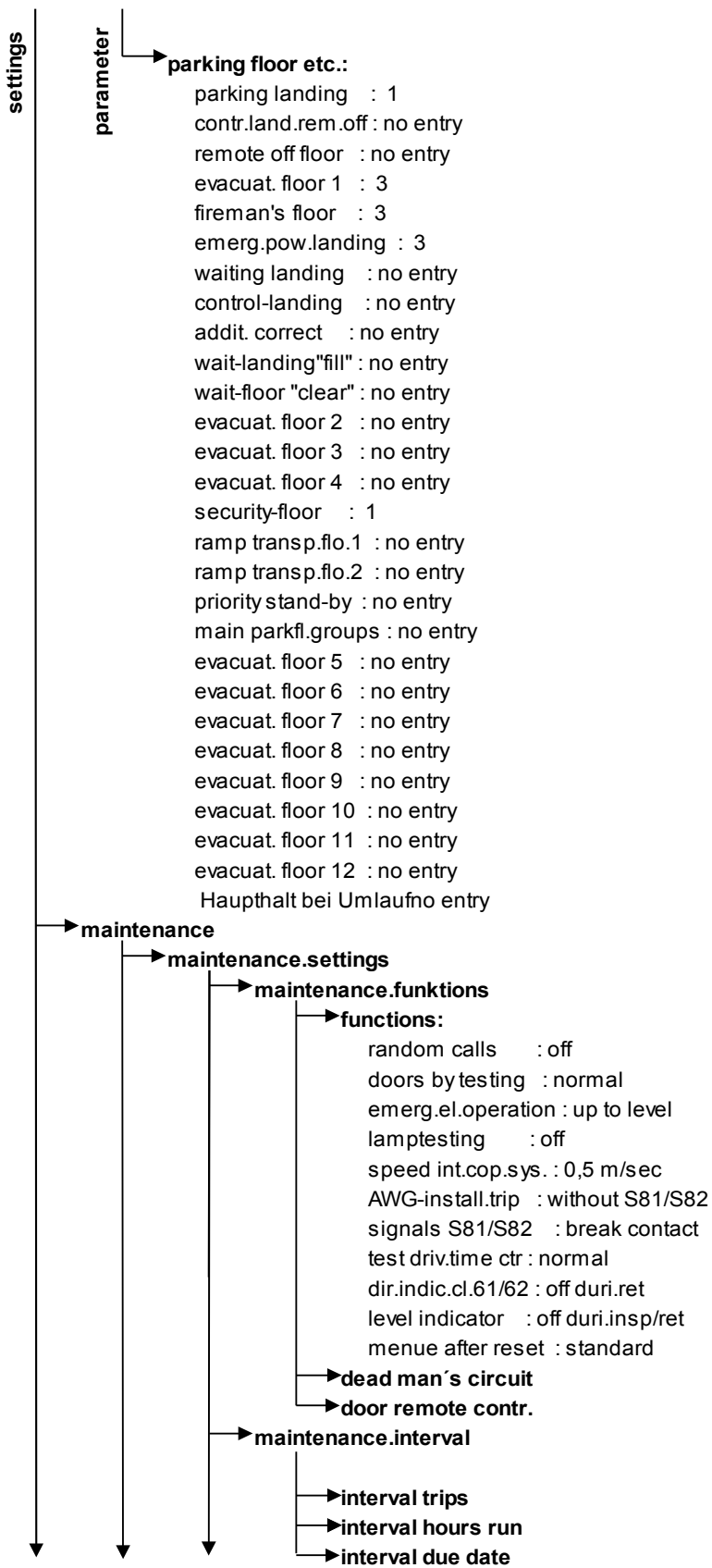


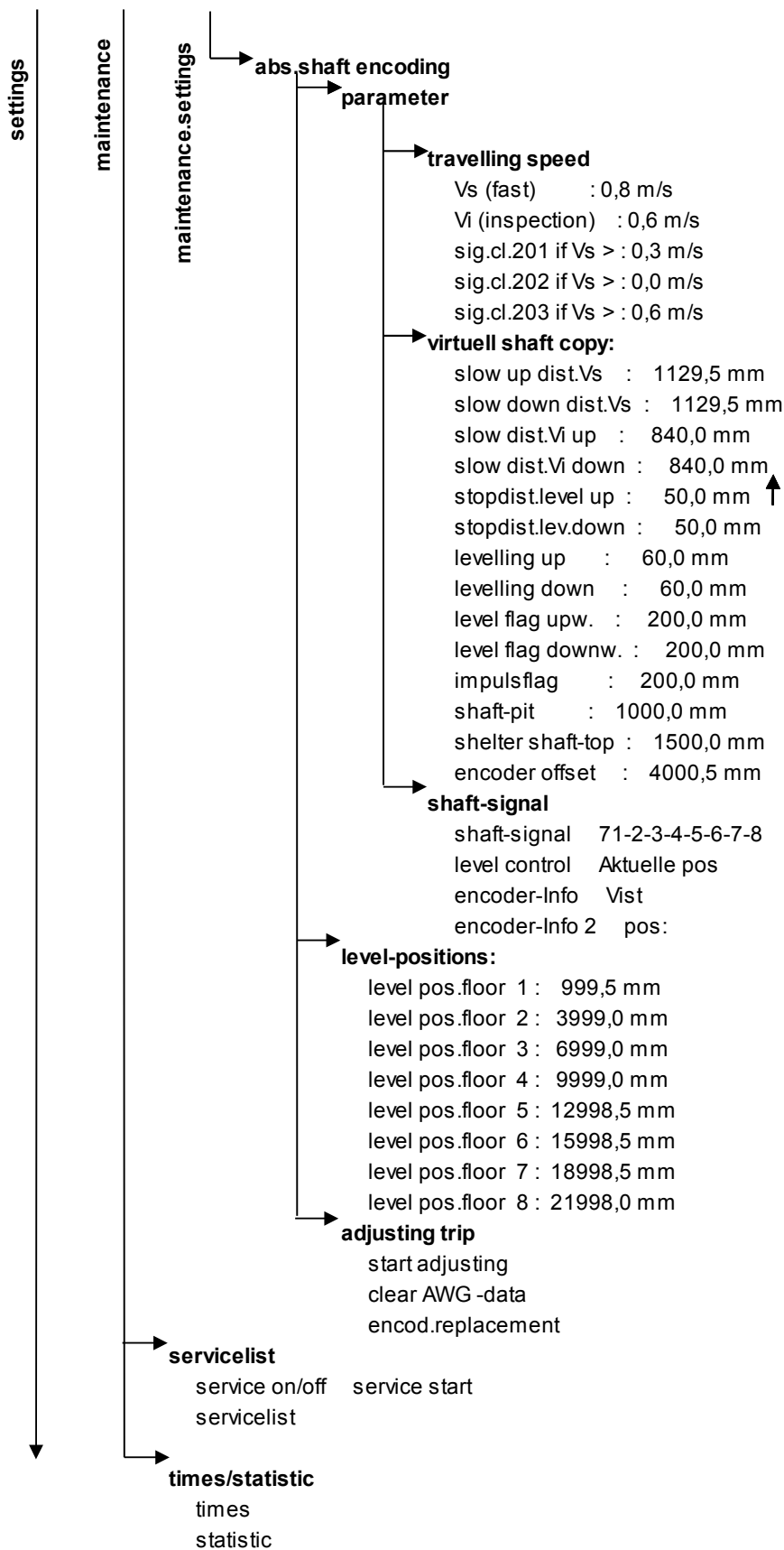
settings

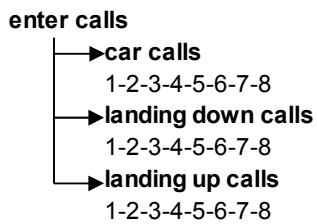
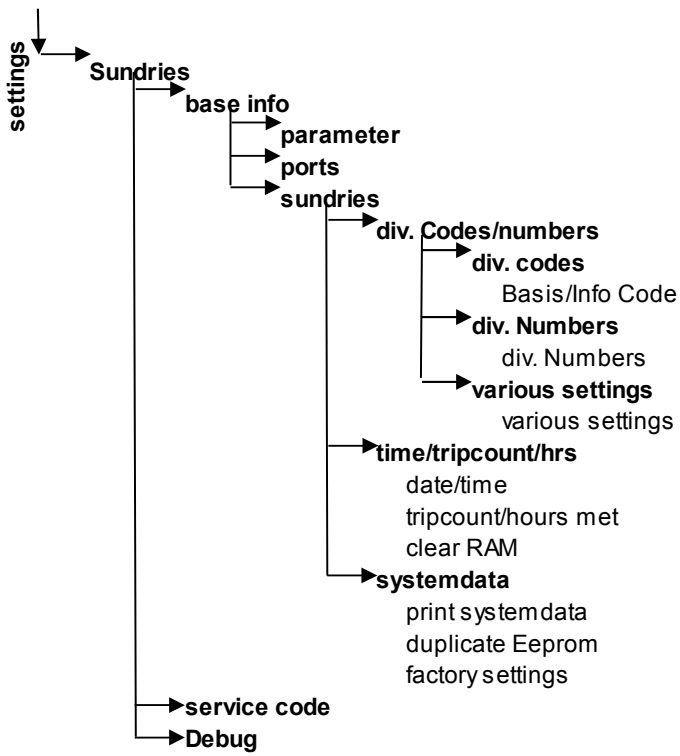




settings	parameter	times
		times,common: holding time after car calls : 10 sec holding time after landing calls : 10 sec parking land.trip : 10 sec gong delay : off gong holding time : 1 sec sign.bouncing time : 30 ms call debounce time : 40 ms hall observation off after ... : 1000 ms Vz-impuls delay land.to land.y.cop : off motor delayed off at levelswitch : off cancel landingcall via hall observat. 5 sec turn off signals during idle state.: off starting lock : off call monitoring cancel calls after : 5 min stand-by delay priority calls : 60 sec stand-by delay special-prior.call : 120 sec standby delay priority-cl.129 : 120 sec door blocking sign time-delay : 30 sec door blocking sign duration : 5 sec delay emerg.call : 2000 ms cent.fault indicat delayed : off mutual locking landing calls : off cl.227 delayed : off hold.time paterno. mode/at contr.lnd. 5 sec early warning driv : off drop off delay Bode magnet : 3 sec control times: door close and locking control : 10 sec start control : 5 sec driving control : 15 sec slow speed cntrol : 15 sec brake control : 1000 ms drop off control sheleter protect. : 1000 ms speed reg.times: starting delay : off brake close delay : off relays off delay : 800 ms brake open delay : off RF/K22 delay : off relevelling on delay time : 1000 ms relevelling off delay time : off debounc.time no ret.valv.retracted : 3000 ms delay no ret.valve during insp/ret.op off times hydraulic: star-delta start : off motor delay off : 500 ms return-time : 15 min relevelling on delay time : 1000 ms valve delay off : off relevelling off delay time : off cascades selction : 1000 ms debounc.time no ret.valv.retracted : 3000 ms delay no ret.valve during insp/ret.op off Abschaltverzögerung am Aufsetzpunkt: off







B Basic Menu Quick Reference

parameter

→ lift data

highest landing : 8
lowest landing: 1
SST at floor : no entry
type of lift : rope with speed regul.frequency
frequency reg.types : F14: VF30 BR/DYN2K Schindler
type of system: group lift 1
shaft copying : processor intern
type of control : full collective select call cancel
cod.pos.indica.A11 : gray code
level offset A11 : 0
combi-cl.25M/26M : cl.63/68
cod.pos.indica.A11 : 26M "on" driving
cod.pos.indica.A11 : 27+28M "off" rest
cod.pos.indica.A15 : 7-segmentcode standard 1-2-3...

→ functions

→ rope speed reg.

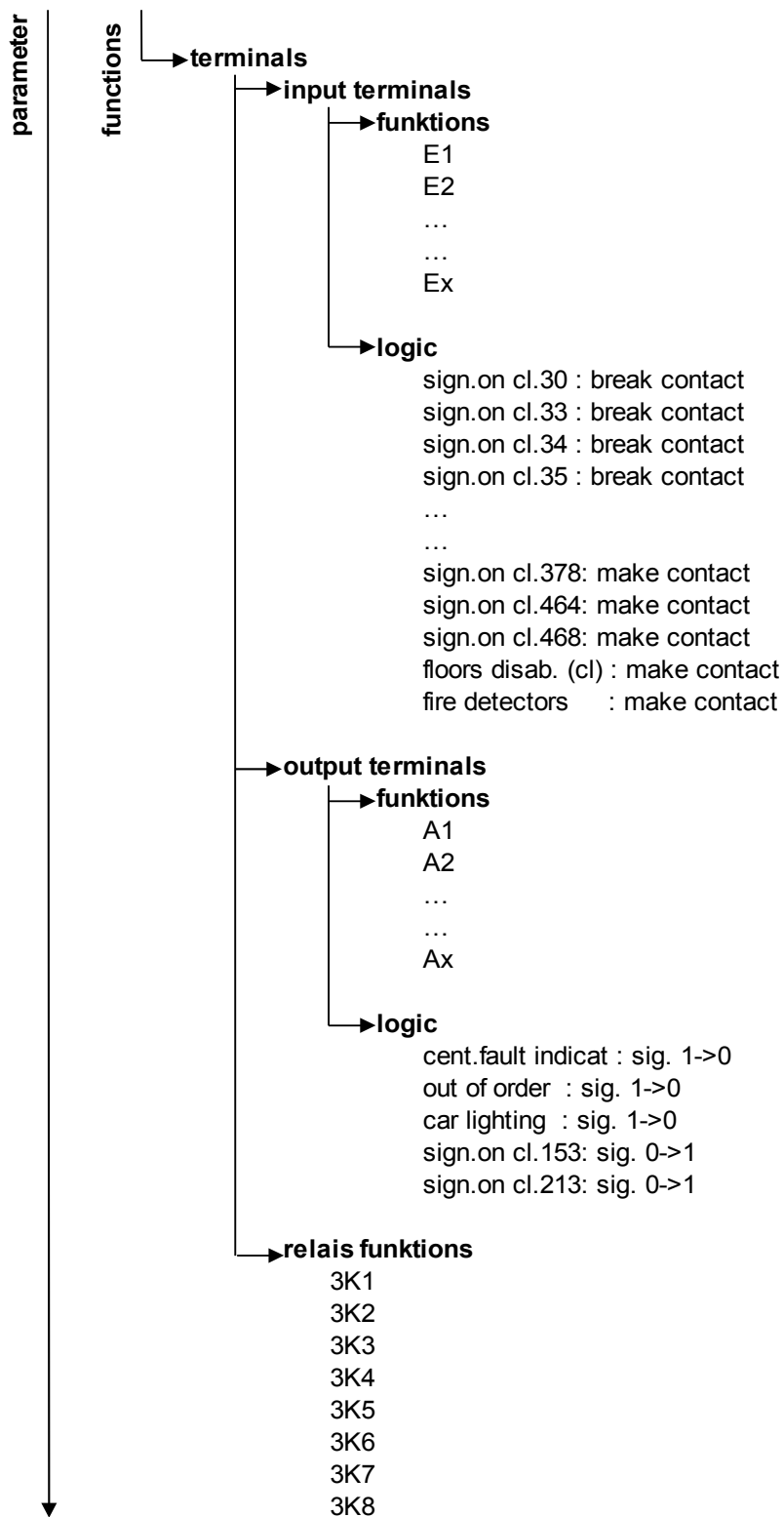
→ re-leveling

safety switching : stop at level with blocking
re-leveilling : off
relevel-switch: make contact
releveilling control: off
re-leveilling : via main device
sep.Nachstellaggr. : ohne Schützüberw.
re-leveilling : with cl.153
leuell.door close : normal
re-leveilling : stop before normal start
re-leveilling : brake not delayed
re-leveilling : without contr.cl88
land.to land.VI : preopening doors: off
tries of releveill. : max.20 (at floor)

→ general

PTC thermistor: immediate stop with blocking
control term.9: with blocking
malfunct.relay off : with blocking
malfunct.cl.30: immediate stop with blocking
Bode sink protect. : no entry
Fölix Absinkverh. : off duri.insp/ret
non return valves : no entry
non return valves : without contacts in saftey-circuit

parameter	functions
	rope speed reg. → speed regulation regulation contr. : immediate stop with blocking traveldirect.sig. : when going down brake open after : start regulation brake close after : level contact re-levelling : brake not delayed sign.on cl.21 : help-sig. brake sign.on cl.31 : make contact mon.cl.31 driving : immediate stop without blocking sign.on cl.34 : break contact cl.34 in rest as : malfunction report speed reduc.top : from Vs to Vz emerg.power trip : normal emerg.ride Vm/VI : to nearest floor malf.speed reg.cl.34 during relev.:off → standard → standard inspection : pushb.fast+door open/close=off inspection : up to level inspection : without close door signal inspection : without lock-sig. cl.48 insp./emerg.el.op. : according EN81 start off zone: distant-trip correction signals : break contact correction after : lowest landing floor selector ctr : without blocking top floor: without impuls E35-configuration : with releve switches emergency stop as : message emergency stop: without callcancel emergency stop as : switch emerg.stop-pushb. : enabl.land.calls aft.open land.door after em.stop : doors open in door zone open saftey circuit: without callcancel open saftey circuit: without correc.trip statussignals A13 : variant 3 (REMS) direction ind."up" : normal direct.indic."down": normal direction indicat. : in idle state on up/down indicator : normal start load-time : with load-button load lift pushb. : car calls cancel lift-loadtime maintenan.interval : without blocking mainten.call-back : off floorfunk.E28-E31 : off clearing calls: when arriving car calls: normal when Ind.calls off : car-calls collect. dur.land.pushb.off : clear car calls at once prior.cabin (64) : off at priority floor priority total(154): normal after priority: clear car calls at once



parameter

→doors

doors : A one side only
type of door A: autom. doors with endswitch
sep.sec-l.b.door A : no
function cl.163 : normal
function cl.168 : entrance supervis.
sign.on cl.191: prewam.close door
sign.on cl.192: forced doorclosing
door A with endsw. : open and close
endswitch door A : make contact
lock types : hook lock
photo-cell : make contact
pushbutton open : make contact
pushbutton close : make contact
load lift pushb. : make contact
pressure limit.dev : make contact
entrance supervis. : make contact
Türe stop: make contact
fault sign.doors : make contact
doors reversion : only within zone
door rev.floorcall : only open
closing doors : normal
after pb.door open : doors closing normal
monit.door circuit : off
door rev.carcall : on
door mot.at lim.sw : off
doortable 1 : door A OOOOOOOO

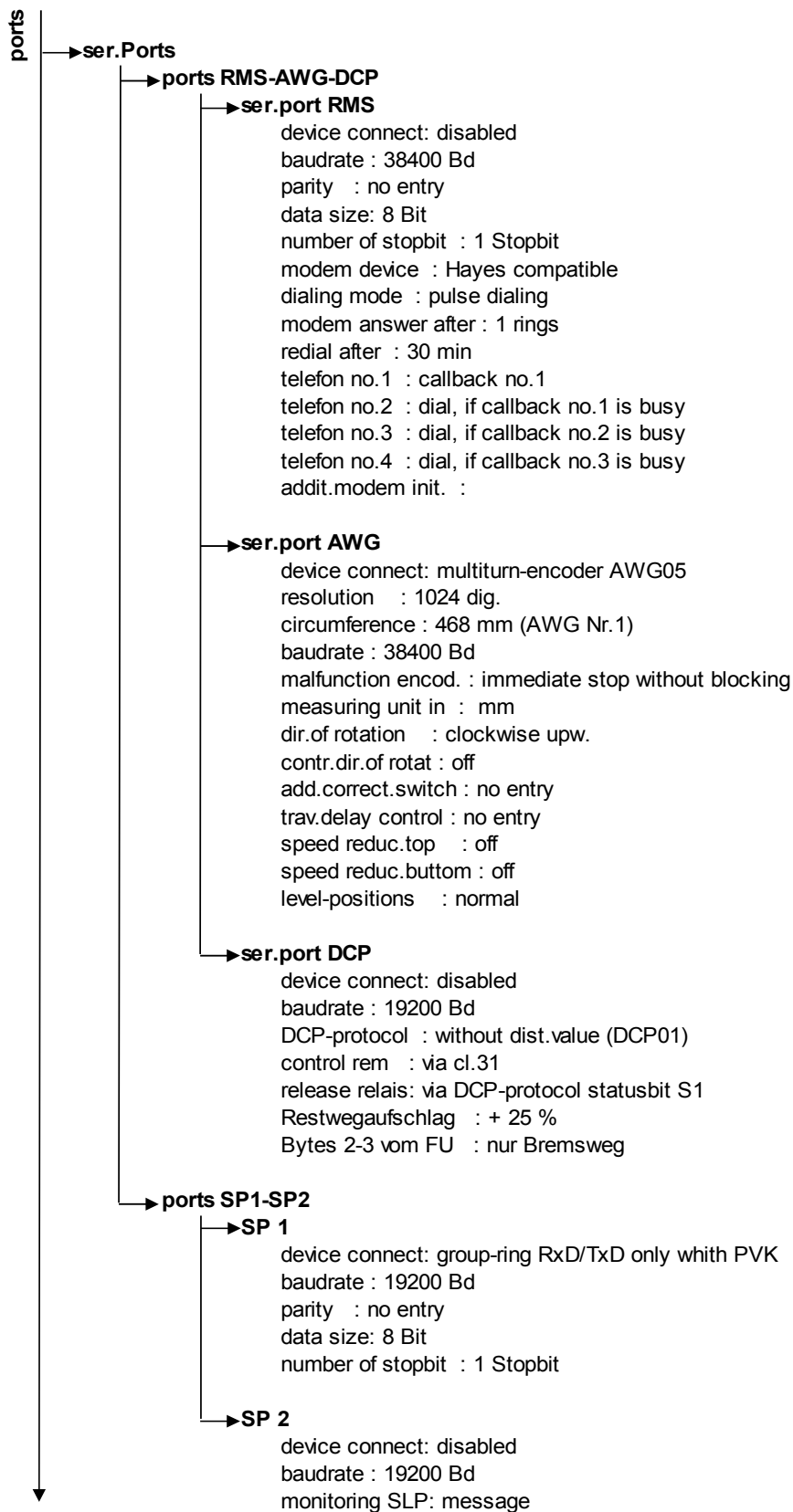
ports

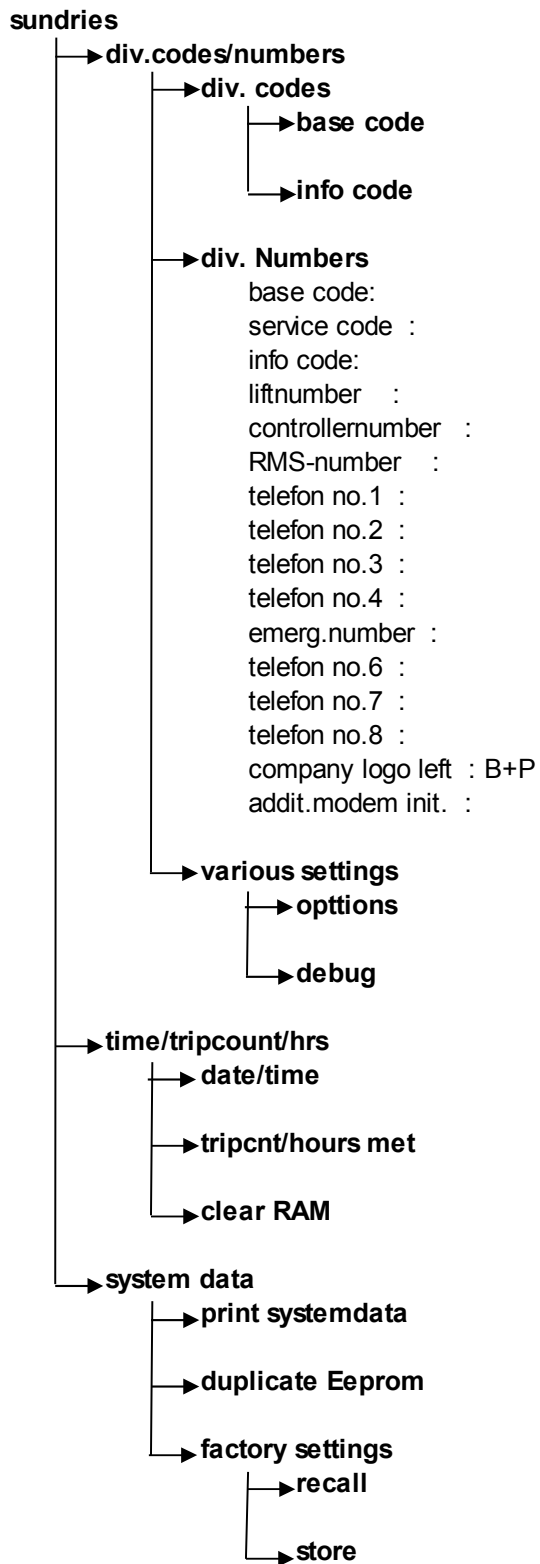
→SBK/SBE config.

SBK/SBE config. : automatically
output-ports : not connect in parallel

→I/O/C-reserv.

port: 1 (8 I) : E121 progr.inputs 1
port: 2 (8 I) : E122 progr.inputs 2
port: 3 (8 O) : A121 progr.Ausgänge 1
port: 4 (8 O) : A122 progr.Ausgänge 2
port: 9 (8 O) : A123 progr.Ausgänge 3
port:10 (8 I) : E124 progr.inputs 4
port:11 (8 I/O/C) : R 25 calls down A 1-8
port:12 (8 I/O/C) : - - ***** free *****
port:13 (8 I/O/C) : R 01 car-calls A 1-8
port:14 (8 I/O/C) : E123 progr.inputs 3
port:21 (8 I/O/C) : R 33 prio.calls A 1-8
port:22 (8 I/O/C) : A 24 dir.arrows down 1-8
port:23 (8 I/O/C) : A 15 dig.display 1th.
port:24 (8 I/O/C) : E 09 emergency function
port:25 (8 I/O/C) : E 04 shaft copy-signals
port:26 (8 I/O/C) : A 20 dir.arrows upw.1-8
port:27 (8 I/O/C) : E 12 comfort door B
port:28 (8 I/O/C) : A 13 single fault sign





C Sequence of Terminals and their Functions

Meaning of the Abbreviations:

Kl.	= terminal designation
E	= Signal input terminal
A	= Signal output terminal
R	= Signal command terminal
U	= Voltage at terminal

C.I Terminal Assignment Mains Unit

Kl.	E/A	U	Description
-----	-----	---	-------------

Power Supply bp306

L/N	230 VAC	AC-voltage input control unit
-----	---------	-------------------------------

Signal Voltage bp306

100	0 VDC	control voltage "Minus" 0 VDC
20A	24 VDC	control voltage "Plus" 24 VDC 2,5 A internal ???
20C	24 VDC	control voltage "Plus" 24 VDC 0,8 A external

C.II Terminal Assignment Printed-Circuit Board BPC

Programmable Terminals

E1-8	E	24 VDC	8 freely programmable input terminals
E9-16	E	24 VDC	8 freely programmable input terminals
A1-8	A	24 VDC	8 freely programmable output terminals
A9-16	A	24 VDC	8 freely programmable output terminals
	A	24 VDC	8 freely programmable output terminals (relay)

Switching Outputs of Absolute Encoder AWG

Q1	A	quick switching output 1 of AWG
Q2	A	quick switching output 2 of AWG

Interfaces bp306

DFÜ-interface (integrated)	interface (RS232) for remote data transmission (Printer, PC, Modem)
AWG-interface (integrated)	interface (RS485) for „old“ absolute encoder (AWG-05)
DCP-interface (integrated)	interface (RS485) for communication to the inverter with DCP-protocole
CAN1 (integrated)	interface (CANopen high speed) for the local bus
CAN2 (integrated)	interface (CANopen high speed) for group-bus and landing calls

C.III Terminal Assignment Printed-Circuit Board BPL

PTC and Zone-Monitoring

PTC	E	Query positive temperature thermistor of motor
PTC	E	Query positive temperature thermistor of motor
SSZ	A	Bridging of active safety circuit
SE1		free (nc)
SE2		free (nc)
ZS1	E	24 VDC signal transmitter zone A (channel 1)
ZS2	E	24 VDC signal transmitter zone B (channel 2)
ZV1	E	24 VDC $V < 0,3 \text{ m/s}$
ZV2	E	24 VDC $V < 0,3 \text{ m/s}$

Pre-Control Rope-Traction

SSZ	A	230 VAC	Bypass of door and locking contact in the zone
1	A	230 VAC	pre-control of safety circuit / lock
2	A	230 VAC	pre-control rope-traction UP
3	A	230 VAC	pre-control rope-traction DOWN
4	A	230 VAC	pre-control rope-traction bridge-terminal 1
5	A	230 VAC	pre-control rope-traction HIGH SPEED
6	A	230 VAC	pre-control rope-traction bridge-terminal 4
7	A	230 VAC	pre-control free
8	A	230 VAC	pre-control rope-traction low-speed / brake regulated

Pre-Control Hydraulic

SSZ	A	230VAC	Bypass for door and locking contact in the zone
1	A	230VAC	pre-control of safety circuit / lock
2	A	230VAC	pre-control hydraulic UP
3	A	230VAC	pre-control hydraulic DOWN
4	A	230VAC	pre-control hydraulic HIGH SPEED VALVE
5	A	230VAC	pre-control hydraulic HIGH SPEED VALVE
6	A	230VAC	pre-control hydraulic bridge-terminal 2
7	A	230VAC	pre-control hydraulic STAR
8	A	230VAC	pre-control hydraulic DELTA

Monitoring of Safety-Circuit

9	N		"N" conductor from mains
10	E	230 VAC	Monitoring of safety-circuit: passive safety-circuit
11	E	230 VAC	Monitoring of safety-circuit: emergency stop
12	E	230 VAC	Monitoring of safety-circuit: landing door
12A	E	230 VAC	Monitoring of safety-circuit: car door A
12B	E	230 VAC	Monitoring of safety-circuit: car door B
13	E	230 VAC	Monitoring of safety-circuit: lock / locking bolt
14	N		"N" conductor to drive-contactors

C.IV Terminal Assignment Printed-Circuit Board CLK

X1 Voltage Supply

0	E	0 VDC	voltage supply to the printed-circuit board
+24	E	24 VDC	voltage supply to the printed-circuit board

X2A / X3A CAN-Bus Connected to X9, X10, X12

S		
CL		CAN low (CL)
CH		CAN high (CH)

X2B / X3B Free Data Line

S		
F		free data line F
E		free data line E

X2C / X3C Free Data Line

S	
D	free data line D
C	free data line C

X2D / X3D Free Data Line

S	
B	free data line B or phone extension
A	free data line A or phone extension

X4A Relay K1

11	relay contact K1 normally closed
11	relay contact K1 normally closed
12	relay contact K1 normally closed

X4B Relay K2

11	relay contact K2 double-throw
12	relay contact K2 double-throw
14	relay contact K2 double-throw

X5A / X5B Voltage Supply

0	A	0 VDC	voltage supply to other printed-circuit boards
+24	A	24 VDC	voltage supply to other printed-circuit boards

X6A to X6D Signal Inputs

E1	E	standard assignment terminal 101 inspection control
E2	E	standard assignment terminal 102 +24 VDC
E3	E	standard assignment terminal 103 inspection control up
E4	E	standard assignment terminal 104 inspection control down
E5	E	standard assignment terminal 85 lockable switch landing control OFF
E6	E	standard assignment terminal 86 signal shortfall in load
E7	E	standard assignment terminal 87 signal full load
E8	E	standard assignment terminal 88 signal overload
E9-E16	E	standard assignment freely programmable input

X9 / X10 CAN-Bus Connection RJ45

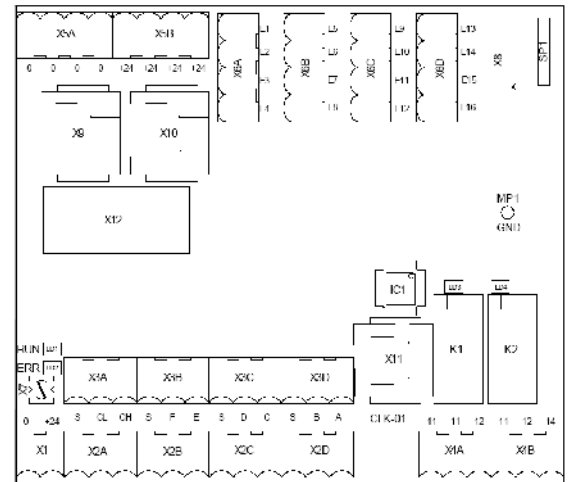
Bus connection e.g. to push-button unit, door control

X11 Phone Extension RJ11

Phone extension connected to X2D / X3D

X12 CAN-Bus Connection D-Sub 9polig

Bus connection e.g. for absolute encoder



Picture 57
Terminal Assignment of CLK-01

C.V Terminal Assignment Printed-Circuit Board CAP

X1 Voltage Supply / Bus Connection

1	24 VDC	Voltage Supply 24 VDC (red)
2	0 VDC	Voltage Supply 0 VDC (black)
3		bus connection CAN-Ground (CG)
4		bus connection CAN-Low (CL, blue)
5		bus connection CAN-High (CH, white)

X2 Inputs/Outputs

1	A	24 VDC	control voltage 24 VDC for the push-buttons
2	E/A/R	24 VDC	freely programmable input, output or standard-call: landing call up, landing X, door A
3	E/A/R	24 VDC	freely programmable input, output or standard-call: landing call down, landing X, door A
4	E/A/R	24 VDC	freely programmable input, output or standard-call: travel continued upwards
5	E/A/R	24 VDC	freely programmable input, output or standard-call: travel continued downwards
6	E/A/R	24 VDC	freely programmable input, output or standard-call: priority call
7	E/A/R	24 VDC	freely programmable input, output or standard-call: buzzer
8	E/A/R	24 VDC	freely programmable input, output or standard-call: occupied
9	E/A/R	24 VDC	freely programmable input, output or standard-call: out of operation
10		0 VDC	control voltage 0 VDC for lamps

C.VI Terminal Assignment in the Port Mode

Selection within Speed-Controlled Plants Rope-Traction/Hydraulic

20	A	Auxiliary signal for brake
21	A	selection RVM type-dependent (see chapter 7.11.3)
22	A	selection RVM type-dependent (see chapter 7.11.3)
23	A	selection RVM type-dependent (see chapter 7.11.3)
24	A	selection RVM type-dependent (see chapter 7.11.3)
25	A	selection RVM type-dependent (see chapter 7.11.3)
26	A	selection RVM type-dependent (see chapter 7.11.3)
27	A	selection RVM type-dependent (see chapter 7.11.3)
28	A	selection RVM type-dependent (see chapter 7.11.3)
29	A	selection RVM type-dependent (see chapter 7.11.3)

Control Signals Input

30	E	Fault terminal 30 (text-setting in basic menu)
31	E	Regulation-/inverter-rope-traction: brake release / activation
32	E	Monitoring of zone-circuitry, e.g. SMZ
33	E	Monitoring of contactor release
34	E	Monitoring of speed-control by inverter or hydraulic system
35	E	Brake released / activated
36	E	Monitoring of light-voltage
37	E	Remote disconnection switch
38	E	Temperature of machine room
39	E	Maintenance on

Control Signals Outputs

40	A		Elevator is starting
41	A	24 VDC	Switch for landing calls
42	A		Landing approach / relevelling with SMZ-04
43	A		Motor tail (valve immediately to be closed)
44	A		Signal: general fault message
45	A		Signal: occupied
46	A		Signal: out of operation
47	A		channel A for zone (AWG-05)
48	A		Lock relay
49	A		emergency call effective / polarityt

Monitoring

50	E		Monitoring excess-pressure hydraulic
51-59	E		free

Info-Display Car

60	A		priority in total
61	A		up
62	A		down
63	A		buzzer
64	A		priority car
65	A		car light off
66	A		close the door
67	A		fullload
68	A		overload
69	A		special priority/emergency control circuitry effective

Well-Selector Signals

70	E		Pulse runtime monitoring (with magnet switches only)
71	E		correction switch TOP
72	E		correction switch BOTTOM
73	E		relevelling switch up
74	E		relevelling switch down
75	E		pulse transmitter up
76	E		pulse transmitter down
77	E		flush-level switch up
78	E		flush-level switch down
79	E		switch for supplementary correction

Various Switches on Car

80	E		2nd door table to be activated
81	E		pre-limit switch top
82	E		pre-limit switch bottom
83	E		signal direct landing-approach active

84	E	lockable switch car priority/variants in standard menu
85	E	lockable switch landing controls OFF
86	E	switch shortfall of load
87	E	switch fullload
88	E	switch overload
89	E	Switch inspection control high-speed

Single Fault Messages

90	A	Shortfall of load
91	A	elevator is about to park/(parking travel initiated)
92	A	free
93	A	free
94	A	free
95	A	free
96	A	elevator is about to be returned (returning travel initiated)
97	A	free
98	A	free
99	A	maintenance on

Inspection Control/Emergency Control/Doors

100	E	0 VDC	"Minus"
101	E		inspection control ON (inspection control overriding emergency control)
102	E		emergency control ON (inspection control overriding emergency control)
103	E		inspection control or emergency control travel up
104	E		inspection control or emergency control travel down
105	A		door A open
106	A		door A close
107	A		door B open
108	A		door B close
109	A		door C open
110	A		door C close

Emergency Functions Inputs

120	E	Travel to secure landing
121	E	emergency power, network ON
122	E	emergency power, travel to emergency power landing
123	E	emergency power, elevator remains operative
124	E	fire emergency/evacuation
125	E	fire-brigade operation lockable switch at landing
126	E	fire-brigade operation lockable switch in car
127	E	make elevator available
128	E	starting blockade
129	E	priority: make available/special priority

Emergency Functions Outputs

130	A	Secure landing reached
131	A	Parking landing reached
132	A	emergency power, landing reached
133	A	emergency power, next elevator can start evacuation
134	A	fire emergency-/evacuation landing reached
135	A	fire-brigade landing reached
136	A	home landing reached
137	A	availability landing reached/(waiting landing)
138	A	starting blockade
139	A	free

Special Functions Inputs

140	E	Door release by switch of mono-control
141	E	parking operation ON/AUS
142	E	attendant operation (lockable switch)
143	E	Arriving/withi 1KSdown alternating up 1KSup
144	E	Leaving/with 1KSup alternating up 1KSdown
145	E	door release up
146	E	Docking operation ON/OFF
147	E	Switch docking operation up
148	E	Switch docking operation down
149	E	Contactor-monitoring during docking operation

Special Functions Outputs

150	A	Telephone/modem change-over switch
151	A	signal: malfunction of doors
152	A	signal: loading time is expiring
153	A	elevator is about to start
154	A	acknowledging remote switching off
155	A	maintenance intervall expiring
156	A	relay remote switching off
157	A	relevelling by auxiliary power unit: up
158	A	relevelling by auxiliary power unit: down
159	A	hydraulic sinking prevention

Comfort Door A

160	E	door A pressure-shaft or draw-in protection
161	E	door A limit-switch open
162	E	door A limit-switch closed
163	E	door A door opening switch/ open the door at Insp.
164	E	door A door closing switch/ close the door at Insp.
165	E	door A switch "loading"
166	E	door A touch-sensitive edge

167	E	door A photocell
168	E	door A hall monitoring
169	E	door A malfunction of door

Comfort Door B

170	E	door B pressure-shaft or draw-in protection
171	E	door B limit-switch open
172	E	door B limit-switch closed
173	E	door B door-opening switch / bei Insp. door öffnen
174	E	door B door-closing switch/ bei Insp. door schließen
175	E	door B switch "loading"
176	E	door B touch-sensitive edge
177	E	door B photocell
178	E	door B hall monitoring
179	E	door B malfunction of door

Comfort Door C

180	E	door C pressure-shaft or draw-in protection
181	E	door C limit-switch open
182	E	door C limit-switch closed
183	E	door C door-opening switch / bei Insp. door öffnen
184	E	door C door-closing switch / bei Insp. door schließen
185	E	door C switch "loading"
186	E	door C touch-sensitive edge
187	E	door C photocell
188	E	door C hall monitoring
189	E	door C malfunction of door

Door: Special Functions Outputs

190	A	Signal light-screen interrupted
191	A	door A warning prior to closing of door
192	A	door A forced closing of door
193	A	door B warning prior to closing of door
194	A	door B forced closing of door
195	A	door C warning prior to closing of door
196	A	door C forced closing of door
197	A	door A door motion
198	A	door B door motion
199	A	door C door motion

Special Outputs

200	A	Car positioned flush with landing level
201	A	speed restricting threshold 1
202	A	speed restricting threshold 2
203	A	speed restricting threshold 3

204	A	free
205	A	free
206	A	warning prior to travel
207	A	free
208	A	free
209	A	docking operation "contactor monitoring"

Special Outputs

210	A	Retract collapsible supports
211	A	erect collapsible supports
212	A	free
213	A	fault message positive-temperature thermistor
214	A	fault message passive safety circuit
215	A	fault message emergency stop
216	A	fault message landing door
217	A	fault message car door 1
218	A	fault message car door 2
219	A	fault message locking bolt

Special Inputs

220	E	Cancelling remote switch off by data remote communication DFÜ
221	E	limit-switch collapsible support retracted
222	E	limit-switch collapsible support erected
223	E	collapsible support circuitry off
224	E	flush-level monitoring AWS
225	E	emergency call AWS
226	E	free
227	E	technical fault
228	E	free
229	E	free

Special Outputs

230	A	fault message AWG
231	A	fault message SLP
232	A	fault message SAP
233	A	free
234	A	free
235	A	free
236	A	free
237	A	free
238	A	free
239	A	free

Special Inputs

250	E	evacuation
251	E	evacuation travel
252	E	elevator to be cleaned
253	E	monitoring of excess motor speedl DSV
254	E	free
255	E	free
256	E	monitoring of overload DSV
257	E	free
258	E	monitoring of standstill DSV
259	E	rotary operation (Sabbath-control)

Special Outputs

260	A	2nd brake-relay
261	A	light-screen test door A
262	A	light-screen test door B
263	A	light-screen test door C
264	A	selective lock door A
265	A	selective lock door B
266	A	selective lock door C
267	A	warning prior to opening door A
268	A	warning prior to opening door B
269	A	warning prior to opening door C

Special Inputs

270	E	releasing switch light-screen door A/B/C
271	E	monitoring of light-screen door A
272	E	light-screen interrupted door A
273	E	monitoring of light-screen door B
274	E	light-screen interrupted door B
275	E	monitoring of light-screen door C
276	E	light-screen interrupted door C
277	E	releasing door A
278	E	releasing door B
279	E	releasing door C

Selection of 2nd RVM

280	A	selection 2nd RVM
281	A	selection 2nd RVM
282	A	selection 2nd RVM
283	A	selection 2nd RVM
284	A	selection 2nd RVM
285	A	selection 2nd RVM
286	A	selection 2nd RVM

287	A	selection 2nd RVM
288	A	selection 2nd RVM
289	A	selection 2nd RVM

Special Signals

290	A	Template
291	A	template
292	A	template
293	A	template
294	A	template
295	A	template
296	A	template
297	A	template
298	A	template
299	A	template

Special Inputs

300	E	
301	E	Fire detector 1
302	E	fire detector 2
303	E	fire detector 3
304	E	fire detector 4
305	E	fire detector 5
306	E	fire detector 6
307	E	fire detector 7
308	E	fire detector 8
309	E	fire detector 9

Special Inputs

310	E	free
311	E	supplementary absolute encoder correction AWG top
312	E	supplementary absolute encoder correction AWG bottom
313	E	free
314	E	correlated door locking
315	E	monitoring of sinking prevention system FÖLIX
316	E	checkpoint landing OFF/ON
317	E	monitoring of function of car-fan
318	E	monitoring of function of EL TACO
319	E	free

Special Signals

320	A	free
321	A	free
322	A	free
323	A	free

324	A	free
325	A	free
326	A	free
327	A	acknowledgement terminal 317
328	A	acknowledgement terminal 318
329	A	template

Car Commands Door A

1A-8A	E/A	Car commands	door A	landing 1-8
9A-16A	E/A	car commands	door A	landing 9-16
17A-24A	E/A	car commands	door A	landing 17-24
25A-32A	E/A	car commands	door A	landing 25-32
33A-40A	E/A	car commands	door A	landing 33-40
41A-48A	E/A	car commands	door A	landing 41-48
49A-56A	E/A	car commands	door A	landing 49-56
57A-64A	E/A	car commands	door A	landing 57-64

Car Commands Door B

1B-8B	E/A	Car commands	door B	landing 1-8
9B-16B	E/A	car commands	door B	landing 9-16
17B-24B	E/A	car commands	door B	landing 17-24
25B-32B	E/A	car commands	door B	landing 25-32
33B-40B	E/A	car commands	door B	landing 33-40
41B-48B	E/A	car commands	door B	landing 41-48
49B-56B	E/A	car commands	door B	landing 49-56
57B-64B	E/A	car commands	door B	landing 57-64

Car Commands Door C

1C-8C	E/A	Car commands	door C	landing 1-8
9C-16C	E/A	car commands	door C	landing 9-16
17C-24C	E/A	car commands	door C	landing 17-24
25C-32C	E/A	car commands	door C	landing 25-32
33C-40C	E/A	car commands	door C	landing 33-40
41C-48C	E/A	car commands	door C	landing 41-48
49C-56C	E/A	car commands	door C	landing 49-56
57C-64C	E/A	car commands	door C	landing 57-64

Landing Calls Door A

1D-8D	E/A	Landing calls	door A	landing 1-8
9D-16D	E/A	landing calls	door A	landing 9-16
17D-24D	E/A	landing calls	door A	landing 17-24
25D-32D	E/A	landing calls	door A	landing 25-32
33D-40D	E/A	landing calls	door A	landing 33-40
41D-48D	E/A	landing calls	door A	landing 41-48

49D-56D	E/A	landing calls	door A	landing 49-56
57D-64D	E/A	landing calls	door A	landing 57-64
Landing Calls Door B				
1E-8E	E/A	Landing calls	door B	landing 1-8
9E-16E	E/A	landing calls	door B	landing 9-16
17E-24E	E/A	landing calls	door B	landing 17-24
25E-32E	E/A	landing calls	door B	landing 25-32
33E-40E	E/A	landing calls	door B	landing 33-40
41E-48E	E/A	landing calls	door B	landing 41-48
49E-56E	E/A	landing calls	door B	landing 49-56
57E-64E	E/A	landing calls	door B	landing 57-64
Landing Calls Door C				
1X-8X	E/A	Landing calls	door C	landing 1-8
9X-16X	E/A	landing calls	door C	landing 9-16
17X-24X	E/A	landing calls	door C	landing 17-24
25X-32X	E/A	landing calls	door C	landing 25-32
33X-40X	E/A	landing calls	door C	landing 33-40
41X-48X	E/A	landing calls	door C	landing 41-48
49X-56X	E/A	landing calls	door C	landing 49-56
57X-64X	E/A	landing calls	door C	landing 57-64
Landing Calls Up Door A				
1F-8F	E/A	landing calls up door A	landing 1-8	
9F-16F	E/A	landing calls up door A	landing 9-16	
17F-24F	E/A	landing calls up door A	landing 17-24	
25F-32F	E/A	landing calls up door A	landing 25-32	
33F-40F	E/A	landing calls up door A	landing 33-40	
41F-48F	E/A	landing calls up door A	landing 41-48	
49F-56F	E/A	landing calls up door A	landing 49-56	
57F-64F	E/A	landing calls up door A	landing 57-64	
Landing Calls Up Door B				
1G-8G	E/A	landing calls up door B	landing 1-8	
9G-16G	E/A	landing calls up door B	landing 9-16	
17G-24G	E/A	landing calls up door B	landing 17-24	
25G-32G	E/A	landing calls up door B	landing 25-32	
33G-40G	E/A	landing calls up door B	landing 33-40	
41G-48G	E/A	landing calls up door B	landing 41-48	
49G-56G	E/A	landing calls up door B	landing 49-56	
57G-64G	E/A	landing calls up door B	landing 57-64	

Landing Calls Down Door A

1H-8H	E/A	Landing calls down	door A	landing 1-8
9H-16H	E/A	landing calls down	door A	landing 9-16
17H-24H	E/A	landing calls down	door A	landing 17-24
25H-32H	E/A	landing calls down	door A	landing 25-32
33H-40H	E/A	landing calls down	door A	landing 33-40
41H-48H	E/A	landing calls down	door A	landing 41-48
49H-56H	E/A	landing calls down	door A	landing 49-56
57H-64H	E/A	landing calls down	door A	landing 57-64

Landing Calls Down Door B

1J-8J	E/A	Landing calls down	door B	landing 1-8
9J-16J	E/A	landing calls down	door B	landing 9-16
17J-24J	E/A	landing calls down	door B	landing 17-24
25J-32J	E/A	landing calls down	door B	landing 25-32
33J-40J	E/A	landing calls down	door B	landing 33-40
41J-48J	E/A	landing calls down	door B	landing 41-48
49J-56J	E/A	landing calls down	door B	landing 49-56
57J-64J	E/A	landing calls down	door B	landing 57-64

Priority Door A

1K-8K	E/A	Priority door A	landing 1-8
9K-16K	E/A	priority door A	landing 9-16
17K-24K	E/A	priority door A	landing 17-24
25K-32K	E/A	priority door A	landing 25-32
33K-40K	E/A	priority door A	landing 33-40
41K-48K	E/A	priority door A	landing 41-48
49K-56K	E/A	priority door A	landing 49-56
57K-64K	E/A	priority door A	landing 57-64

Priority Door B

1L-8L	E/A	Priority door B	landing 1-8
9L-16L	E/A	priority door B	landing 9-16
17L-24L	E/A	priority door B	landing 17-24
25L-32L	E/A	priority door B	landing 25-32
33L-40L	E/A	priority door B	landing 33-40
41L-48L	E/A	priority door B	landing 41-48
49L-56L	E/A	priority door B	landing 49-56
57L-64L	E/A	priority door B	landing 57-64

Priority Special Door A

1KS-8KS	E/A	Priority special door A	landing 1-8
9KS-16KS	E/A	priority special door A	landing 9-16
17KS-24KS	E/A	priority special door A	landing 17-24
25KS-32KS	E/A	priority special door A	landing 25-32

33KS-40KS	E/A	priority special door A	landing 33-40
41KS-48KS	E/A	priority special door A	landing 41-48
49KS-56KS	E/A	priority special door A	landing 49-56
57KS-64KS	E/A	priority special door A	landing 57-64

Priority Special Door B

1LS-8LS	E/A	Priority special door B	landing 1-8
9LS-16LS	E/A	priority special door B	landing 9-16
17LS-24LS	E/A	priority special door B	landing 17-24
25LS-32LS	E/A	priority special door B	landing 25-32
33LS-40LS	E/A	priority special door B	landing 33-40
41LS-48LS	E/A	priority special door B	landing 41-48
49LS-56LS	E/A	priority special door B	landing 49-56
57LS-64LS	E/A	priority special door B	landing 57-64

Landing Indication 1 of N

1N-8N	A	Landing indication 1 of N	landing 1-8
9N-16N	A	landing indication 1 of N	landing 9-16
17N-24N	A	landing indication 1 of N	landing 17-24
25N-32N	A	landing indication 1 of N	landing 25-32
33N-40N	A	landing indication 1 of N	landing 33-40
41N-48N	A	landing indication 1 of N	landing 41-48
49N-56N	A	landing indication 1 of N	landing 49-56
57N-64N	A	landing indication 1 of N	landing 57-64

Landing Indication Digital

1M-8M	A	Landing indication digital	units position segment a-h
11M-18M	A	landing indication digital	decimal position segment a-h

Landing Indication Gray-Code

21M-24M	A	landing indication coded	bit 0 to bit 3
25M-26M	A	landing indication coded	bit 4 to bit 5

Direction Indication Up / Elevator at Landing

1P-8P	A	Direction indication up	landing 1-8
9P-16P	A	direction indication up	landing 9-16
17P-24P	A	direction indication up	landing 17-24
25P-32P	A	direction indication up	landing 25-32
33P-40P	A	direction indication up	landing 33-40
41P-48P	A	direction indication up	landing 41-48
49P-56P	A	direction indication up	landing 49-56
57P-64P	A	direction indication up	landing 57-64

Direction Indication Down / Elevator at Landing

1R-8R	A	Direction indication down	landing 1-8
9R-16R	A	direction indication down	landing 9-16
17R-24R	A	direction indication down	landing 17-24

25R-32R	A	direction indication down	landing 25-32
33R-40R	A	direction indication down	landing 33-40
41R-48R	A	direction indication down	landing 41-48
49R-56R	A	direction indication down	landing 49-56
57R-64R	A	direction indication down	landing 57-64

Buzzer Selective Down

1S-8S	A	Buzzer selective down landing	1-8
9S-16S	A	buzzer selective down landing	9-16
17S-24S	A	buzzer selective down landing	17-24
25S-32S	A	buzzer selective down landing	25-32
33S-40S	A	buzzer selective down landing	33-40
41S-48S	A	buzzer selective down landing	41-48
49S-56S	A	buzzer selective down landing	49-56
57S-64S	A	buzzer selective down landing	57-64

Buzzer Selective Up

1SA-8SA	A	Buzzer selective up landing	1-8
9SA-16SA	A	buzzer selective up landing	9-16
17SA-24SA	A	buzzer selective up landing	17-24
25SA-32SA	A	buzzer selective up landing	25-32
33SA-40SA	A	buzzer selective up landing	33-40
41SA-48SA	A	buzzer selective up landing	41-48
49SA-56SA	A	buzzer selective up landing	49-56
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